**FIGURES** 

Proje	ect De	LOG OF BORING N scription: Big Branch Slurry Impoundment Inve			<u>4</u>		3		Λ		
Depth, feet	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
- 10 - 15		fragements, damp, loose to medium dense  - more clayey (25.0' - 26.5')  - SPOIL/FILL -	<b>Ar</b> W	ae fir	7-4-3 3-5-9	t a d	anth	of			
Date E	eer/Geo	tarted: 12/1/00 approximately 35 ft. completed: 12/2/00	lurin	g dril	ling opera	ation	s. Coi	ntiņue	ed Ne	ext Pa	age

Pro	ojec	t Des		G OF BORING Nurry Impoundment Inv , Kentucky			<u> </u>	L	7		4	\ [	
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	<b>:</b>	Recovery %	ROD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X	o	Brown <u>CLAYEY SAND</u> with fragments, damp to wet, loo - w/few coal fragments (30.0)	se to medium dense			5-6-15						
- 35 -	X		- wet @ 35 ft., w/some sub-and shale fragments (35.0'				5-5-6						
- 40 -   - 45 - 	X		- numerous sandstone fragn traces	nents and some root			10-12-9						
 - 50 - 	X						2-3-3						
-55- 	X	· · · · · · · · · · · · · · · · · · ·	- brown sand lens (55.0' - 55				10-9-7						
iPJ <i>2/27/</i> 01		a	- gray sandstone boulder (57										
Date Date	e Bor e Bor	/Geolo	nrted: 12/1/00 mpleted: 12/2/00	Remarks: <b>Groundwa</b> approximately 35 ft.					S.	of ntinue	ed Ne	ext Pa	age

	Pr	ojed	t Des	LOG OF BOR scription: Big Branch Slurry Impound Martin County, Kentucky				9	L	7	}			
	Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553- Surface El.: 1052.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	_			Brown <u>CLAYEY SAND</u> with sandstone fragments, damp to wet, loose to medium de	nse			50/2"						
-	- - 65			- SPOIL/FILL -	65.0									
	- -	X		Brown and gray <u>CLAYEY SAND to SANDY</u> <u>CLAY</u> with some sandstone fragments, damp dense to very dense	о,			10-14-19						
	- - 70 -						i.							
-	_	X						19-21-21						
_	- 75 -							11-34-39						
		/ \												
-	- 80 				81.0	50	0	50/1"						
	_		\ \ \ \	Brown <u>SANDSTONE</u> , medium hard, weatherd friable gray, fractured (82.5' - 83.6')	ed, 83.6									
	85 - 			VOID (Partially Filled)										
1 1/0/12/2 (-	-					17	4							
RING C00553.	Date Date Eng	e Boi	r/Geolo	arted: 12/1/00 approximate appleted: 12/2/00	ely 35 ft. o	durin	g dri		ation	s. Cor		ed Ne	ext Pa	age

Pro	ojec	t Des		G OF BORIN urry Impoundmer v, Kentucky				۳.		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.4 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	t		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
-			VOID		91.5									
			COAL, broken		92.9									
- -95-			Gray <u>CLAY SHALE</u> , very so sandier and medium hard w	oft to soft, becoming with depth		100	70							
		$\leq$			96.8									
			Bottom of Test Bor	ing @ 96.8 ft.				,						
												İ		
400-														
-														
105-														
-														
110-														
-														
<b>├</b>														
<b> </b>														
115-														
	:													
5 -														
1 2/2/														
Date Date Eng	e Bor e Bor	/Geolo	rted: 12/1/00 mpleted: 12/2/00	Remarks: Grour approximately 3				st noted a			of			

				OF BORING N			Liadeng.com		5		Z		1
Pro	jeci	Des	cription: Big Branch Slui Martin County,	rry Impoundment Inve Kentucky	stiga	ation	triaden					\	J
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESC		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse <u>COAL REFUSE</u>	4.0									
- 5- (			Brown <u>CLAYEY SAND</u> with sa fragments, damp, loose to ver										
-10-				,			4-5-5						
-15			- boulder (17.0' - 18.0')				4-4-4						
- 20 - 2							6-5-6						
- 25	X		- more clayey, with plant root to a specific spe				3-5-5						
10/72/2		a	- boulder (29.5' - 30.5')			i i							
Date Date	Bor Bor neer	/Geolo	oth: 101.9 feet arted: 12/4/00 mpleted: 12/4/00	Remarks: <b>Groundwat</b> drilling operations.	er wa	as fir	st noted a	t a d		of 50			

Pr	ojec	t Des	LOG OF BORING N cription: Big Branch Slurry Impoundment Inv Martin County, Kentucky			<u> </u>		7			\	
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		0 0 0 0	Brown <u>CLAYEY SAND</u> with some sandstone fragments, damp, loose to very dense			29-5-4						
- 35 - 			- boulder (35.0' - 36.0')			50/5"						
 - 40 - 			<ul><li>- boulder (38.5' - 39.2')</li><li>- very clayey, w/possible slurry laminations (40.0' - 41.5')</li></ul>			7-10-40						
  - 45 -												
		0	- possible slurry laminations (46.0' - 46.5')			21-25-38	1			·		
- 50 - 			- wet, w/possible slurry fines @ 50.0 ft.			16-12-11						
- 55 -			- SPOIL/FILL - 55.0									
	X		Brown <u>CLAYEY SAND to SANDY CLAY</u> with some sandstone fragments, wet, very dense			24-12-28			-			
Dat Dat Eng	e Bor e Bor	/Geolo	arted: 12/4/00 drilling operations.	ter wa	as fir	st noted a	t a de		of 50			

Pr	ojec	t Des	LOG OF BORING cription: Big Branch Slurry Impoundment Martin County, Kentucky				<u> </u>		7				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Brown <u>CLAYEY SAND to SANDY CLAY</u> with some sandstone fragments, wet, very dense				12-25-39						
-65-				25.0			30-50/4"						
			Brown <u>SANDSTONE</u> , medium hard, fine to medium grained, weathered, friable	65.8			00 00/1						
-		//											
- 70 - -       -		<b>*</b> //			75	48	50/3"						
					73	40							
 - 75 -  			- gray and brown with occasional carbonaceous laminations (74.1' - 83.4')		100	78							
-80-		\ \ \											
-				-									
-		<u>``</u>		83.4									
85-			VOID										
-			(Partially Filled)										
1 1													
20 - 90 - - 90 - Col	molet	ion De	pth: 101.9 feet Remarks: Ground		26 r wa	23 as fir	st noted a	t a d	epth	of 50	ft. d	urina	
Date Date Date Date Date Date Date Date	te Bo te Bo	ring St ring Co r/Geolo	arted: 12/4/00 drilling operation oppleted: 12/4/00	is.								ext Pa	

Pro	ojec	t Des		OG OF BORII durry Impoundme y, Kentucky				triadeng.com	Ī	7	}	4		)
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawin Surface El.: 1052.4 fe Split Spoon Shelby Tube Rock Core MATERIAL DI	et		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			VOI (Partially		94.4									-
-95- 		$\mathbb{N}\mathbb{N}$	Gray <u>CLAY SHALE</u> , very sandier and medium hard											
100		W > > > > > > > > > > > > > > > > > > >	Gray <u>SANDSTONE</u> with s medium hard to hard, fine		97.5	98	98							
		Ž	Bottom of Test Bo	ring @ 101.9 ft.	101.9									,
105-								•						
110 -  														
 -115 -  														
Date Date Eng	e Bor e Bor	/Geolo	arted: 12/4/00 mpleted: 12/4/00	Remarks: Grou drilling operati		er wa	as fir	st noted a	at a d	epth	of 50	ft. d	uring	<b>)</b>

Pr	oject	t Des		OF BORING N ry Impoundment Inve			3		3		1		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing N Surface El.: 1055.6 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESC	lo. C00553-1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse <u>COAL REFUSE</u> Brown <u>CLAYEY SAND</u> with sal fragments, damp, loose to med			:							
  - 10 -		a					6-6-9						
  - 15 -		a	- trace coal fragments (15.0' - 1	16.5')			5-4-2						
  -20-							3-5-6						
- 25							6-4-4						
	moletic	on Der	-SPOIL/FILL	- Remarks: <b>Groundwat</b>	er wa	as fir	st noted a	nt a d	enth	of 40	.0 ft	durir	าต
Dat Dat Eng	e Bori e Bori	ing Sta ing Co /Geolo	rted: 12/4/00 mpleted: 12/5/00	drilling operations.	GI <b>V</b> V (		st noteu e	a u		ntinue			

Pro	oiec	t Des		G OF BORIN				ų		<b>5</b>		A		7
			Martin County					triade						
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1055.6 fee  Split Spoon Shelby Tube Rock Core  MATERIAL DES	t		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X		Brown <u>CLAYEY SAND</u> with fragments, damp, loose to r					12-5-15						
  - 35 -			- SPOIL/F	ILL -	35.0									
 	X		Brown <u>CLAYEY SAND to S</u> some sandstone fragments dense					16-24-23						
- 40 -40	X				40.5			17-50/5"						
		<i>`</i> ,'	Brown <u>SANDSTONE</u> , medingrained, weathered, friable	um hard, medium				50/0"						
- 45 - 45			- gray, medium hard to hard	from 43.4 ft.										
  - 50		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- occasional carbonaceous (46.9' - 54.6')	laminations		95	71							
 		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	occasional iron stains ((53	.8' - 55.7')										
- 55 - - 5 -						100	64							
PJ 2/27/01						100	94							
Dat Dat Eng	e Bor e Bor	r/Geolo	arted: 12/4/00 mpleted: 12/5/00	Remarks: Grou drilling operation		er wa	as fir	st noted a	t a d		of 40			

-	-Jec		eription: Big Branch Slurry Impoundment Martin County, Kentucky		-	triadeng.com					<u>\</u>	
		.	Location: See Drawing No. C00553-1			v				%		
e e	ype	Symbol / USCS	Surface El.: 1055.6 feet	8		Penetration Blows / 6 inches	%	\ o	Silt and Clay %	Water Content %	aj t	
Depth, feet	Sample Type	n/	Split Spoon	Recovery %	RQD	trati 6 in	Gravel %	Sand %	👸	ont	Liquid Limit	loofie Lineir
eptl	dmg	oqu	Shelby Tube	00   00   00	~	ene ws/	Gra	Sa	an	Jei O	inbi.	1
	ις.	Syr	Rock Core	122		B B			<u> </u>	Wa	_	-
			MATERIAL DESCRIPTION									
	1	`	Gray <u>SANDSTONE</u> , medium hard to hard, medium grained						:			
		ľ, į							:			
		$\times$										
		$\leq$										
-65 –		<i>/</i> /										
. –		$\left  \right\rangle /$	- iron-stained horizontal fracture @ 66.0 ft.									
-				99	85							
-		<b>/</b> /										
_		//	- brown w/some iron-staining (68.9' - 70.1')									
70-		<i>/</i> /	and (70.6' - 71.1')									
		$\left  \begin{array}{c} \times \\ \times \end{array} \right $										
-		$^{\prime\prime}$										
_		//										
-		<i>/</i> /										
75-		$\times$										
_										-		
_		$^{\prime\prime}$		100	95							
		//										
		<i>&gt;</i>										
								ļ				
80 -		Ĭ,	- modulus of rupture							:		
-		<b>//</b>	(84.2' - 85.0') - 485 psi (85.4' - 86.0') - 346 psi									
	H	//	(00.4 - 00.0) - 040 psi					į				
_		<i>/</i> _/	unconfined compressive strangth	•								
_		( <u>/</u> , /	<ul><li>unconfined compressive strength</li><li>(83.9' - 84.2') - 6,100 psi</li></ul>					ł				
85		Ĭ,	(85.0' - 85.4') - 5,464 psi									
65-		$\langle \rangle$										
_		///	- iron-stained @ 87.5 ft.		_							
-		<i>//</i>	·	55 37.6	50							
-			VOID									
_			VOID									
90-					<u> </u>		<u> </u>	<u>L</u>	<u> </u>		L	L
Cor		ion De ring Sta			as fir	st noted	at a d	epth	of 40	).U ft.	duri	nç

Pro	ojec	t Des	LOG OF BORI cription: Big Branch Slurry Impoundment Martin County, Kentucky				1		7	} /			)
eet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1055.6 feet  Split Spoon		Recovery %		Penetration Blows / 6 inches	%	%	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
Depth, feet	- Se	) / c	Shelby Tube		ove	P B	etra / 6 i	Gravel %	Sand %	و ا	Ö	l bi	itic 1
Dep	am	ğ E	Rock Core		Rec	_	Pen	ပြ	Š	i ar	ater	Ęi	Plas
:	0)	જિ	MATERIAL DESCRIPTION				ă			S	Š		
			VOID	91.5									
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Gray <u>SANDSTONE</u> , medium hard to hard, medium grained, iron-stained										
 -95-				95.4	70	56							
-			VOID										
		>		97.4									
		$\leq$	Gray <u>CLAY SHALE</u> , very soft to soft, becoming sandier and medium hard with depth										
_		$\leq$	Sandier and medium hard with depth		76	64							
100-		$\leq$											
-		$\leq$											
	H	$\geq$					-						
		$\langle \rangle$		103.5									
		<b>/</b>	Carry CANIDSTONIE with shale leminations		100	100							
105-		$\leq$	Gray <u>SANDSTONE</u> with shale laminations, medium hard, fine to medium grained		100	100							
L _		ľ,											
L _		$\angle A$		106.9									
	]		Bottom of Test Boring @ 106.9 ft.			3.8							
140													
110-						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
<b>-</b>													
<b>-</b>						İ							
<b>-</b>													
+ -	-												
115-	-												
-	-												
L -													
L -													
2													
2							<u></u>						
§ Dat	e Bor	ion Dering Sta			er w	as fii	st noted a	at a d	epth	of 40	.0 ft.	duri	ng
Eng		r/Geold											

Proje	ect Des		G OF BORING N urry Impoundment Inve , Kentucky			<u> </u>		7		1	\[	
Depth, feet	Symbol / USCS	Location: See Drawing Surface El.: 1054.9 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
- 5-		Coarse <u>COAL REFUSE</u> Brown <u>CLAYEY SAND</u> with fragments, damp, loose to m										
- 10		- trace coal and organic frag	ments (10.0' - 11.5')			6-5-8						
- 15		- mostly sandstone fragmen	ts (15.0' - 16.5')			14-12-6 4-3-4						
- 25		- SPOIL/FI	LL -			4-5-5						
Date E	oletion Der Boring Sta Boring Co eer/Geolo	arted: 12/6/00 mpleted: 12/6/00				-		Coi	ntinu			age

Pr	ojec	t Des		G OF BORING				3		1	1	A		7
		, ,	Martin County,					triad						
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.9 feet Split Spoon Shelby Tube Rock Core MATERIAL DES			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X	a	Brown <u>CLAYEY SAND</u> with s fragments, damp, loose to m					13-8-7						
- 35 -			- few wood fragments (35.0'	- 36.5')				6-7-7						
 - 40 -  			- brown and gray w/trace woo (40.0' - 41.5')	od fragments				5-6-6						
		0'	- SPOIL/FII	LL -										
-45 - 	X		Brown <u>CLAYEY SAND to SA</u> some sandstone fragments,	NDY CLAY with	45.0			31-38-42						
	-	- <u> </u>												
- 50 -	$\approx$	· · ·	1,500		50.3			50/4"						
			Gray <u>SANDSTONE</u> , medium medium grained	n hard to hard,		100	0							
			- coal band (50.3' - 50.7')											
- 55 -			- iron-stained, w/occasional of laminations (50.7' - 51.0')	carbonaceous		99	84							
2/27/01			- iron-stained (53.2' - 53.5') a	and (54.0' - 57.0')										
60-	mplet	ion De	oth: 106.7 feet	Remarks: Water v	was r	note	d at a	depth of	83.9	ft. ur	oon d	rillin	a	
Dat Dat Eng	te Boi te Boi	ing Sta ing Co r/Geolo	arted: 12/6/00 mpleted: 12/6/00	completion.			ut 6	. aspail of	-5.0	-	ntinue			age

P	roje	ct Des	LOC ecription: Big Branch Slu Martin County,					3		7		Δ		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.9 feet Split Spoon Shelby Tube Rock Core MATERIAL DESC			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Gray <u>SANDSTONE,</u> medium medium grained	hard to hard,										
-65			- iron-stained, w/occasional c inclusions (63.4' - 68.0')			-								
			- weathered, w/numerous dia (65.8' - 67.4')	gonal fractures		100	69							
- 70 - 		\ \ \ \ \												
 75														
			- unconfined compressive stre (78.9' - 79.3') - 4,950 psi (83.2' - 83.8') - 3,291 psi	ength		100	100							
- 80 - 80			- modulus of rupture (78.0' - 78.7') - 280 psi (84.0' - 84.5') - 388 psi											
			- vertical fracture w/iron stain (81.7' - 83.2') and (84.5' - 85	.5')	:		2	ļ						
- 85 - 			VOID	- D	85.5	47	21							
		tion De	1	Remarks: <b>Wa</b> t	ter was	note	d at a	depth of	83.9	ft. up	on d	rilling	g	
Eng	e Bo	r/Geolo	mpleted: 12/6/00	completion.	·						ntinue	ed Ne	ext Pa	age

Pro	ojec	t Des	LOG OF BORING  cription: Big Branch Slurry Impoundme Martin County, Kentucky				2		3				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1054.9 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		V V	VOID Gray <u>SHALEY SANDSTONE</u>	91.1 91.8									
  - 95 -			VOID (Partially Filled)		12	0							
-		V V		96.2 96.7									
		M	Gray <u>SANDSTONE</u>	/	0	0							
100-			Gray <u>CLAY SHALE</u> , very soft to soft, becoming sandier and medium hard with depth		93	89							
		MMW.		103.9	100	100							
105-		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Gray <u>SANDSTONE</u> with shale laminations, medium hard, fine grained	106.7									
			Bottom of Test Boring @ 106.7 ft.										
110- 													
<del>1</del> 15-												-	
120													
Com Date Date Eng	e Bor e Bor	/Geolo	nted: 12/6/00 completion.	r was	note	d at a	depth of	83.9	ft. up	oon d	rillin	g	

Proj	ject Des		G OF BORING N urry Impoundment Inve , Kentucky			<b>7 - 2</b> triadeng.com	L	7		4	\[	
Depth, feet	Sample Type Symbol / USCS	Location: See Drawing Surface El.: 1054.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	i	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
- 5-		Coarse <u>COAL REFUSE</u> Brown <u>CLAYEY SAND</u> with fragments, damp, loose to d										
		- mostly sandstone fragment	ts (15.0' - 16.5')			6-5-7						
- 20		- more clayey (20.0' - 26.5')				4-4-4						
- 25		- root and plant traces (25.0' - wet @ 30.0 ft SPOIL/F				11-8-4						
Date Date Engin	pletion De Boring Sta Boring Co neer/Geold ect No.:	arted: 12/6/00 mpleted: 12/8/00	Remarks: Groundwat drilling operations.  The stratification lines report					Cor	of 31			

			LO	G OF BORIN	G N	0. 1	DH1	- 5     ខ្ញុំ I		П			\	
Pr	ojec	t Des	cription: Big Branch Slo Martin County	urry Impoundmen , Kentucky	t Inve	stiga	ation	triadeng.com		4	1/		7 [	J
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	i		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X	a	Brown <u>CLAYEY SAND</u> with fragments, damp, loose to d					16-13-36						
	-		- boulder (31.5' - 33.0')											ļ !
-35- 	X	a						6-5-25						
		0 .			·								1	
	X		- trace coal fragments (40.0)	- 41.0')				1-11-50/5"						
- 45-	-		- boulder (41.0' - 43.5') - SPOIL/Fl	LL -	45.0									
			Brown SANDY CLAY to CLA some sandstone fragments,					11-50/3"						
- 50-														
	X							17-20-21						
- 55-					55.0			50/3"						
			Brown <u>SANDSTONE</u> , mediugrained, weathered, friable	ım hard, medium				JWS						
00553.GPJ 2/27/01		ion Der		Remarks: <b>Gro</b> un		er wa	as fir	st noted a	t a d	epth	of 31	.5 ft.	durir	ng
Date Eng	te Bor	ring Co r/Geolo	mpleted: 12/8/00	The stratification line							ntinue	ed Ne	ext Pa	age

Pro	oject	t Des	LOG OF BORING I cription: Big Branch Slurry Impoundment Inv Martin County, Kentucky			triadeng.com		7		4	\	
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1054.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Brown <u>SANDSTONE</u> , medium hard, medium grained, weathered, friable	100	100	50/3"						
			- gray, medium hard to hard from 60.6 ft.									
-65- 		\ \ \ \ \	- diagonal fracture @ 65.2 ft.	99	74							
 		\ \ \ \ \ \ \ \	- vertical fracture (66.6' - 66.9')									
- 70 - 			- occasional carbonaceous inclusions (67.5' - 86.1')									
  -75-		\ \ \ \ \ \ \										
				99	99							
 -80-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- modulus of rupture (82.0' - 82.5') - 249 psi (84.0' - 84.6') - 275 psi									
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- unconfined compressive strength (83.2' - 83.7') - 5,920 psi (84.6' - 85.1') - 4,230 psi									
- 85 - 		\ \ 	- sandy shale band (85.4' - 86.1')									
 			VOID - void sample (87.3' - 90.6') brown sand and gravel	31	30	}						
Dat Dat Eng	te Bo	r/Geolo	arted: 12/6/00 drilling operations. ompleted: 12/8/00	 ater w	as fir	st noted	ata d		of 3'			

Pro	ojec	t Des	LOG OF BORING N scription: Big Branch Slurry Impoundment Inv Martin County, Kentucky			2		4		A		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1054.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 95 -			VOID (Partially Filled)									
			96.4									
		$\mathbb{N}\mathbb{N}$	Gray <u>CLAY SHALE</u> , very soft to soft, becoming sandier and medium hard with depth		÷, 494							
 100 -				50	34							
		WWW\	103.6						 			
  			Gray <u>SANDSTONE</u> with shale laminations, medium hard, fine to medium grained	100	100							
		\ <u>\</u>	109.3									l
110-		V V	Bottom of Test Boring @ 109.3 ft.									
							:					
- 115 - 												
- 120 - 120												İ
Con Date Date	e Bor e Bor	ion De ring Sta ring Co r/Geolo	arted: 12/6/00 drilling operations.	ter w	as fir	st noted a	t a d	epth	of 31	.5 ft.	durir	ıg

Pro	ojec	t Des		G OF BORING Jurry Impoundment Jr, Kentucky			٠		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawin Surface El.: 1051.4 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	t	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		Dep esta	th: 99.8 feet			ıs firs	st noted a	t a de	epth	of 40	.0 ft.	durin	ng
Date Date Date Proje	Bori	ng Cor 'Geolog	npleted: 12/8/00	drining operation	Э.				Con	ntinue	ed Ne	ext Pa	age

Pro	ojec	t Des		G OF BORIN Irry Impoundmen Kentucky			<u> </u>		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1051.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
35 -			Coarse <u>COAL REFUSE</u>		35.0								
	X		Brown and gray <u>CLAYEY SA</u> fragments, damp, loose to de				8-8-11						
-40- 	X		<ul> <li>wet @ 40.0 ft.</li> <li>shelby tube (40.0' - 42.0') be silty to clayey sand with san</li> </ul>		75			17	46	37			
 - 45 -	X		Silly to clayey Salid with Sali	usione fragments	80								
			- shelby tube (45.0' - 46.0') la fragment with some silty sa					:					
-50-  	X		- mostly sandstone fragments	s ( 50.0' - 61.5')			8-8-10						
- 55 - 5	X						11-25-24						
 5-60-		· · · · · · · · · · · · · · · · · · ·	- SPOIL/FIL										
Con Date Date Eng	e Bor e Bor	/Geolo	rted: 12/8/00 mpleted: 12/8/00	Remarks: Groun drilling operatio		vas fir	st noted a	t a d				durir ext Pa	

	<b></b>	ioo	· Doo		G OF BORING N			۳.		5		7		•
Ľ	-10	jec:	Des	cription: Big Branch Slu Martin County,			auon	triade			1/			
Denth feet	בפלווי, ופפנ	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1051.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
-	-	X		Brown and gray <u>CLAYEY SA</u> fragments, damp to wet, loos	ND with sandstone se to medium dense			9-10-11						
- - 6:	5 - 2	X		- trace coal fragments (60.0'	- 61.5')			12-18-14						
- - -7	0-			- SPOIL/FI	LL - 70.0									
	-	X		Brown <u>CLAYEY SAND to SA</u> some sandstone fragments, dense	NDY CLAY with damp, dense to very			19-25-26						
7:  	5 - 2	X					`	24-49-50/6"						
-8 - -	0-	X						35-36-24						:
- -8 -	5	X			00.0			9-15-19-27 20-40-50/3"						
PJ 3/2/01	-		, <del></del> .	COAL SLURRY	88.3									
RING C00553.	Date Date Engi	Bor Bor	/Geold	arted: 12/8/00 ompleted: 12/8/00	Remarks: Groundwa drilling operations.					Coi			durii	

Pro	ojec	t Des	LOG OF BORING cription: Big Branch Slurry Impoundment Ir Martin County, Kentucky				6 triadeng.com		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1  Surface El.: 1051.4 feet  Split Spoon  Shelby Tube  Rock Core  MATERIAL DESCRIPTION	Recovery %		RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			90		-								
		WWWW	COAL 90  Gray CLAY SHALE, very soft to soft, becoming sandier and medium hard with depth	98	3	45							
-95- 		AMMMMMM &	98	.1	0	42	,						
 -100 -		`	Gray <u>SANDSTONE</u> with shale laminations, medium hard, fine to medium grained 99	.8									
 			Bottom of Test Boring @ 99.8 ft.					The control of the co					
105 - 				ī				1 1 1 1					
110-													
.   .													
 115- 													
Date Date Eng	e Boi e Boi	r/Geold	arted: 12/8/00 drilling operations ompleted: 12/8/00		_  was	s fir	st noted a	i at a d	epth	of 40	).0 ft.	duri	ng

Pro	oject	: Des	cription: Big Branc	LOG OF BO h Slurry Impound unty, Kentucky				triadeng.com		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drain Surface El.: 1052.1  Split Spoon Shelby Tube Rock Core MATERIAL	=	-1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse COAL REFUS	E Remarks: C	Groundwat	er w	as fir	st noted	at a d	epth	of 50	).0 ft.	duri	ng
Dai Dai Dai Dai Dai	te Bo te Bo	ring Sta ring Co r/Geolo	arted: 12/8/00 empleted: 12/9/00	drilling op	erations.						ntinu			

Pr	ojec	t Des		G OF BORING N urry Impoundment Inve Kentucky			triadeng.com		7		4	\	
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.1 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 35 - 			Coarse <u>COAL REFUSE</u> Brown <u>CLAYEY SAND</u> with fragments, damp, loose to verify the second second second second second second second second second second second second second second second second second second second sec				14-8-5						
			- very clayey ( 45.0 - 51.5 ft.	)			8-7-6						
- 50			- with some plant roots ( 50.0	O - 51.5 ft. )			4-4-5						
PJ 2/27/01			- wet @ 55.0 ft mostly sandstone fragment				14-24-26						
Dat Dat Eng	te Bor te Bor	r/Geolo	arted: 12/8/00 mpleted: 12/9/00	Remarks: Groundwat drilling operations.	er wa	as fir	st noted a	t a d		of 50			

	Pro	ojec	t Des		G OF BORIN urry Impoundmen , Kentucky				Ÿ		7		4		
	Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.1 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	ŧ		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
-	_	X		Brown <u>CLAYEY SAND</u> with fragments, damp, loose to v					5-13-11						
-		i		- SPOIL/FI	LL -	65.0									
-	65 — — —	X		Brown <u>CLAYEY SAND to SA</u> some sandstone fragments, dense	ANDY CLAY with damp, dense to very				8-15-16						
-  -  -	- 70 -	\ /		- boulder @ 73.7 ft.					10.00.07.45						
	1	X							19-22-27-40 1-26-64-50/2	ļ <b>ii</b>					
	- 75 - -														
							21	0							
 	30 — —														
-	1 1						14	0							
-	85-					85.7									
+	1			COAL			94	0							
3PJ 2/27/0	00														
KING C00553.	Date Date Eng	e Bor e Bor	r/Geolo	rted: 12/8/00 mpleted: 12/9/00	Remarks: <b>Groun</b> drilling operatio		er wa	as fir	st noted a	t a de		of 50			

Pr	ojec	t Des	LOG OF BORING N cription: Big Branch Slurry Impoundment Inve			triadeng.com	Ī	3		1		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.1 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 95 - 			Gray CLAY SHALE, very soft to soft, becoming sandier and medium hard with depth	100	68							
			Gray SANDSTONE with shale laminations, medium hard, fine grained  Bottom of Test Boring @ 100.4 ft.									
3ING C00553.GPJ 2/28/01 T COI T COI	e Bo e Bo	r/Geold	arted: 12/8/00 drilling operations.	ter w	as fir	st noted a	at a d	epth	of 50	).0 ft.	durii	ng

F	Proje	ect	Desc		G OF BORING urry Impoundment In Kentucky			<b>8</b> -	Ī	4		4		
				Location: See Drawing	No. C00553-1									
	١,	o l	တ္သ	Surface El.: 1053.2 feet				L sec			8	# %		ي. ا
Denth feet		<u></u>	) NSC	Split Spoon		Recovery %	اما	atior incl	%	8	Slay	nten	Liquid Limit	Plastic Limit
f		ble	<u> </u>	Shelby Tube		8	RQD	netra s / 6	Gravel %	Sand %	Pu	ပို	pin	stic
ے ا		Sample 1ype	Symbol / USCS	Rock Core		A &		Penetration Blows / 6 inches	0	0	Silt and Clay %	Water Content %	<u>=</u>	Pa
			S	MATERIAL DES	SCRIPTION			Δ.			"	\$		
-				Coarse COAL REFUSE										
l			$\approx$	,										
			>>											
-			$\approx$		5.							i		
	5		<i>∞</i>			4								•
-	-	ŀ	· a	Brown <u>CLAYEY SAND</u> with a fragments, damp, dense to v										
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ē l			a	- SPOIL/FI	LL -									
7 2/2	4		۵											
_3  -3		le*	on Da	oth: 105.1 feet	Remarks: Water wa	s note	d at a	denth o	f 82 n	ft. 10	non r	lrillin	ıa	l
	Date E Date E	Bori Bori		arted: 12/11/00 mpleted: 12/11/00	completion.	J 11016	<b> a.</b> a	aopiii 0	. 52.0	16. U	yon C	a :	ษ	
	Engino Projec		/Geolo lo.:	C00553						Co	ntinu	ed N	ext P	age

Pr	ojec	t Des	LOG OF BORING N cription: Big Branch Slurry Impoundment Inve Martin County, Kentucky			<u></u>		7				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1053.2 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
-40			Brown CLAYEY SAND with sandstone fragments, damp, dense to very dense  - SPOIL/FILL -  55.0  Brown CLAYEY SAND to SANDY CLAY with some sandstone fragments, damp, very dense			17-15-23 26-50/1"						
Dat Dat Eng	e Bor e Bor	r/Geolo	arted: 12/11/00 completion.	note	u at a	a uepin ot	o∠.U				g ext Pa	age

	Φ	SS	Location: See Drawing No. C00553-1 Surface El.: 1053.2 feet		9		n Jes			%,	ıt %	ı,	
Depth, feet	Sample Type	Symbol / USCS	Split Spoon		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay	Water Content %	Liquid Limit	Plastic I imit
epth	ald me	logu	Shelby Tube		(ecov	R	enet ws / (	Grav	San	t and	ter C	iquio-	Jactiv
_)	Š	Syr	Rock Core		Œ		8 B			Si	Wa	_	Ц
	ļ		MATERIAL DESCRIPTION										
_	X		Brown <u>CLAYEY SAND to SANDY CLAY</u> with some sandstone fragments, damp, very dense				28-26-32						
_													
_													
65 -	*	<u> </u>		65.0			50/2"						
-		\ <u></u>	Brown <u>SANDSTONE</u> , medium hard, medium to coarse grained, weathered, friable										
_		$\langle \rangle$			92	73							
_		$\langle \rangle  $											
70 -		<b>/</b> /	high angle freehure / 67.0 G7.6 # \			-							
_		<b>//</b>	- high angle fracture ( 67.0 - 67.6 ft. )										
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- with occasional diagonal fractures ( 67.6 - 68.7 ft. )										
-		//	- gray ( 67.6 - 84.2 ft. )										
75-		Ž/	g.a, (01.0 01.2 la )		102	89							
-		<i>`</i> ,,	- modulus of rupture (79.5' - 80.1') - 344 psi										
-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	(83.0' - 83.8') - 398 psi										
		//	- unconfined compressive strength										
30 -	П	Ž,	(81.2' - 81.7') - 5,700 psi (82.6' - 83.0') - 4,125 psi										
-		Ň,											
_		×,	- void ( 84.0 - 84.2 ft. )										
_		×,				¥.							
35-		<b>/</b> /	- gray shale ( 84.2 - 85.0 ft. )	85.0									
_			VOID										
_			11										
-			<ul> <li>void sample (85.0' - 91.4') brown sand and gravel</li> </ul>										
-													
90-							depth of		L			<u> </u>	L

			Martin County, Kentucky  Location: See Drawing No. C00553-1			triadeng.com					<b>.</b>	
		S	Surface El.: 1053.2 feet			se			8	%		
eet	Гуре	SC		Recovery %		tion	%	%	ilay	tent	Liquid Limit	::::
Depth, feet	Je J	1/10	Split Spoon	over	RQD	etra / 6 i	Gravel %	Sand %	S S	§	je L	1
Dep	Sample Type	Symbol / USCS	Shelby Tube Rock Core	Rec	_	Penetration Blows / 6 inches	Ö	Š	Silt and Clay %	Water Content %	Liq	
	0)	S)	MATERIAL DESCRIPTION			<u>~</u>			S	≶		
			WATERIAL DESCRIPTION	- 100			<u> </u>					L
				100	90							
			VOID									
-			(filled w/sand and gravel)									
-												
95-			9	5.3								
-		$\leq$	Gray CLAY SHALE, very soft to soft, becoming									
	į	$\leq$	sandier and medium hard with depth									
		$\leq$										
		$\leq$										
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		$\langle$		100	94		1					
			10	4.3								
05			10	5.1								
05		Ţ	Gray <u>SANDSTONE</u> with shale laminations, medium hard, fine to medium grained									
-				-'								
_			Bottom of Test Boring @ 105.1 ft.									
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_												
10-												
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_												
-				-								
15-												
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-												
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_						:						
^-												L
20 - Cor	nplet	ion De	oth: 105.1 feet Remarks: Water w	as note	d at a	depth of	82.0	ft. u	oon c	Irillin	q	

Pro	ojec	t Des	cription:		G OF BORI urry Impoundme Kentucky				friadeng.com	L	3		4		)
Depth, feet	Sample Type	Symbol / USCS	Surface s	on: See Drawing e El.: 1051.1 feet plit Spoon helby Tube ock Core MATERIAL DES			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		on Degining Sta	oth:	104.8 feet 12/12/00	Remarks: Wat	er was	note	d at a	depth of	29.0	ft. up	oon d	rillin	g	
Date Date Date	e Bor	ing Co /Geolo	mpleted:	12/12/00 12/12/00 JEN/CEM C00553	completion.						Coi	ntinue	ed Ne	ext Pa	age

Pr	ojec	t Des		G OF BORIN urry Impoundme , Kentucky				Friadeng.com		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1051.1 feet Split Spoon Shelby Tube Rock Core MATERIAL DES			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
Dat	e Bor e Bor	on Depth in graph of the state	rted: 12/12/00 mpleted: 12/12/00	dium dense to very	55.0	noted	d at a	depth of	29.0					
ි Pro	ject N		C00553	The stratification li							ntinue	ea Ne	ext Pa	age

P	rojec	t Des	cription: Big Branch SI	G OF BORIN				<u> </u>		1	?	A		
			Martin County  Location: See Drawing		· · · · ·							٠٥		
l t	ype	Symbol / USCS	Surface El.: 1051.1 fee	t		%		Penetration Blows / 6 inches	8		Silt and Clay %	Water Content %	nit	mit
Depth, feet	le T	J / I	Split Spoon			very	Rab	etrati '6 in	Gravel %	Sand %	Ö	Sonte	Liquid Limit	ic Li
Dep	Sample Type	Jupo	Shelby Tube Rock Core			Recovery %	<u> </u>	Pene ows /	Gra	Sa	lt an	ater (	Liqu	Plastic Limit
	"	S	MATERIAL DE	SCRIPTION				B			S	W		_
	X	00	Brown and gray <u>CLAYEY S</u> fragments, damp to wet, me dense					15-11-16-18						-
-	$\left\{ \right\}$		uciise					14-21-18-16						
-65	X	a						16-15-14-15						
-			- boulder @ 66.0 ft.					50/3"						
-	X	a	- mostly brown @ 68 ft., w/t	race coal fragments				37-15-47-24						
-70-	$\langle \cdot \rangle$	, ' , 'a												
-	+X	٥٠٠						9-18-14-37						
<u> </u>	$\langle \cdot \rangle$	ρ	- w/trace wood fragments (7	0.0' - 74.0')										
	$\frac{1}{1}$	· a	- SPOIL/Fi				1	0-17-28-50/3	,"					
-	$\frac{1}{7}$	· · · ·			74.0			35-39-46-42						
−75 -	$\bigvee$	. :: . :: :	Brown CLAYEY SAND to Some sandstone fragments,					55-59-46-42						
							2	4-38-39-50/5	,"					
		- <u> </u>												
<u> </u>	$\mathbb{N}$							16-27-44-42						ı
-80-	$\langle \rangle$													
ļ	X							31-36-55-54						
<u> </u>	$\langle \rangle$	[:-::  -:::-	- boulder @ 82 ft.											l
ļ	X	-	- boulder @ 02 it.					50-82/6"						
ļ		[-1]												
85	11													i
L.														
L.		-:				10	0							
L.	H	[: <u>-</u> :]										ŀ		
27/01														
06   GPJ 2/		-:   -:												
Co Da Da	te Bor te Bor		arted: 12/12/00 mpleted: 12/12/00	Remarks: Water completion.	was	note	d at a	depth of	29.0	ft. up	on d	rilling	9	
En Pro	gineer oject N	r/Geolo lo.:	gist: JEN/CEM C00553							Cor	ntinue	ed Ne	xt Pa	ige

<u> </u>			LO	G OF BORI	NG N	10.	DH	1- 9 🚦 [				1		
Pro	ojec	t Des	cription: Big Branch Si Martin County	urry Impoundme , Kentucky	ent Inve	estig	ation	1-9 Itriadeng.com	L	4	1			
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1051.1 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	t		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		WWW[: 1: 1: 1: 1:	Brown <u>CLAYEY SAND to S</u> some sandstone fragments dense - trace coal fragments @ 92  Gray <u>CLAY SHALE</u> , very so sandier and medium hard w	, damp to wet, very  2 ft.  oft to soft, becoming	92.5	56	0							
- 95 -   						101	91							
		M>>>>>>>	Gray <u>SANDSTONE</u> with shamedium hard to hard, fine to		101.0									
105			Bottom of Test Bori	ng @ 104.8 ft.										
410 -  														
  							-							
Date Date Engi	Bori Bori	/Geolo	rted: 12/12/00 mpleted: 12/12/00	Remarks: Wate completion.	r was ı	noted	d at a	depth of	29.0	ft. up	on d	rilling	9	

Pr	ojec	t Des		G OF BORII urry Impoundme r, Kentucky				triadeng.com		3			\	
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.1 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	t		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		on Dept		ILL -		er wa	ıs firs	st noted a	t a de	•pth	of 50	.O ft.	durin	g
Date Date Date Proj	e Bori	/Geolo	mpleted: <b>12/13/00</b>	drilling operati	ions.					Con	tinue			

Pro	oject	Des		OF BORING N urry Impoundment Inve Kentucky			<u> </u>		3		4		)
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.1 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
- 40			Brown and gray CLAYEY SA fragments, damp, medium defined the second seco	ense to very dense	er w	as fir	29-13-12 6-7-7	t a d	enth	of 50	O ft	duri	200
Cor Dat Dat Eng	e Bor e Bor	/Geolo	arted: 12/13/00 mpleted: 12/13/00	Remarks: <b>Groundwat</b> drilling operations.	er wa	as fir	st noted a	t a d				<b>duri</b> i ext Pa	

Project De	LOG OF BORING escription: Big Branch Slurry Impoundment I Martin County, Kentucky			3	L	3				
Depth, feet Sample Type Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.1 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	Brown and gray <u>CLAYEY SAND</u> with some sandstone fragments, damp to wet, medium dense to dense			18-19-25						
	- SPOIL/FILL -	0								
65	Brown SANDY CLAY to CLAYEY SAND with some sandstone fragments, damp, medium dense to very dense			13-20-31						
70	- - - - -									
				23-36-47-28						
	- <u>-</u> -			18-15-10-11						
75	77	.0		12-17-9-9 20-16-50/4"						
	Brown <u>SANDSTONE</u> , medium hard, medium grained, weathered, friable	88	33	50/1"						
-80-	VOID VOID		33							
	- void sample (80.6' - 85.7') brown silty sand with rock fragments	15	o							
- 85   	7.2% gravel 82.6% sand 10.2% silt and clay									
Completion D Date Boring C	tarted: 12/13/00 drilling operations		as fir	st noted a	t a de	epth	of 50	.0 ft.	durir	ng

Pro	ojec	t Des		G OF BORIN urry Impoundme r, Kentucky				3		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.1 fee Split Spoon Shelby Tube Rock Core MATERIAL DES	i .		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		<b>V</b>	SANDSTONE BOULDER VOID		90.3 91.3	37	7							
		>			94.4									
- 95 -        			Gray <u>CLAY SHALE</u> , very so sandier and medium hard w	ft to soft, becoming ith depth	104.9	100	80							
			Gray <u>SANDSTONE</u> with sha medium hard, fine grained	ale laminations,	109.9	100	94							
110 -   115 -			Bottom of Test Borin	ng @ 109.9 ft.	103.3									
Date Date Eng	Bor Bor	/Geolo	nted: 12/13/00 mpleted: 12/13/00	Remarks: <b>Grou</b> drilling operation	ons.			st noted a			of 50	.0 ft.	durir	ng

Pro	ojec	t Des		G OF BORIN rry Impoundmen Kentucky				triadeng.com		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1057.8 feet Split Spoon Shelby Tube Rock Core MATERIAL DES			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse <u>COAL REFUSE</u>		0.5									
  - 5-			Brown <u>CLAYEY SAND</u> with s fragments, damp AUGER W/OUT S											
 - 10 - 														
 - 15 - 														
- 20														
		0	Gray <u>SANDSTONE,</u> medium	hard to hard,	26.0									
GPJ 2/28/01		\ \ \ \ \ \ \	medium grained											
Con Date Date Eng	e Bor e Bor	/Geolo	nted: 12/13/00 mpleted: 12/14/00	Remarks: Water completion.	was r	noted	l at a	depth of	86.5				g ext Pa	age

Pro	ojec	t Des	cription: Big Branch Slu	OF BORING N			2		4	} ],	A		
Depth, feet	Sample Type	Symbol / USCS	Martin County,  Location: See Drawing  Surface El.: 1057.8 feet  Split Spoon  Shelby Tube Rock Core  MATERIAL DES	No. C00553-1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Gray <u>SANDSTONE</u> , medium medium grained - weathered, soft to medium										
-35 - 			- occasional coal laminations	(34.8' - 38.4')	100								
-40-			- occasional shale clasts (35.	5' - 39.0')	100	68						-	
  - 45 -		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\											
			- iron-stained (48.2' - 51.1')		97	90							
- 50 - 50			- vertical fracture (50.3' - 51.0	)')									
 55-		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- occasional carbonaceous la (52.1' - 59.1')	minations									
27/01					97	87							
Date Date	Bor Bor	/Geolo	rted: 12/13/00 mpleted: 12/14/00	Remarks: Water was completion.	note	d at a	depth of	86.5		oon d			age

Pro	ojec	t Des		G OF BORING N urry Impoundment Inve Kentucky			<u> </u>		7				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1057.8 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Gray <u>SANDSTONE</u> , mediun medium grained	n hard to hard,									
- 65 			- fractured (66.1' - 66.5')		100	91							
 70 		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- occasional carbonaceous la (69.1' - 90.4')	aminations									
 - 75 - 		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	•		100	92							
 - 80 - 													
  _ 85 _		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- iron-stained (83.6' - 86.0')										
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			89	89							
Date Date Eng	e Bor e Bor	/Geolo	rted: 12/13/00 mpleted: 12/14/00	Remarks: Water was completion.	note	d at a	depth of	86.5	-			g ext Pa	age

Pro	ojec	t Des	LOG OF BORII cription: Big Branch Slurry Impoundme Martin County, Kentucky				<u>9</u>		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1057.8 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			VOID	90.4									
			- void sample (92.6' - 96.2') brown silty sand with rock fragments										
 -95- 			<ul><li>1.3% gravel</li><li>93.3% sand</li><li>5.4% silt and clay</li><li>void sample (96.1' - 97.1') gray silty sand with rock fragments</li></ul>		0	0							
100-			15.8% gravel 55.0% sand 29.2% silt and clay	100.5									
		$\sqrt{N}$	Gray <u>CLAY SHALE</u> , very soft to soft, becoming sandier and medium hard with depth		100	92							
105-		M/M/		106.3									
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Gray <u>SANDSTONE</u> with shale laminations, medium hard, fine to medium grained		100	60							
110-		//		111.0					Ì		1		
			Bottom of Test Boring @ 111.0 ft.										
 -115 - 								·					
Date Date Engi	Bori Bori	/Geolo	inted: 12/13/00 completion.	er was	noted	d at a	depth of	86.5	ft. up	on d	rillin	g	

Р	rojec	t Des		G OF BORIN urry Impoundment , Kentucky				triadeng.com		3		4		
			Location: See Drawing	No. C00553-1										
پ ا	l g	SS	Surface El.: 1056.2 fee	t		%		Penetration Blows / 6 inches			%/	Water Content %	يبا	🛓
Depth, feet	Sample Type	Symbol / USCS	Split Spoon			Recovery %	Q	ratio	Gravel %	Sand %	Silt and Clay %	ntei	Liquid Limit	Plastic Limit
l tg	l gu	log /	Shelby Tube			Š	RQD	aneti 's / 6	rav	Sanc	and	S	pink	astic
ے ا	Sar	l Ř	Rock Core			8		Now See	0		Silt	Vate	Ĕ	풉
			MATERIAL DES	SCRIPTION				ш				>		
	P		Coarse <u>COAL REFUSE</u>		1.0									
	1	a	Brown <u>CLAYEY SAND</u> with fragments, damp	some sandstone										
	4													
- 5 -	4	a	AUGER W/OUT	SAMPLING										
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		a												
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g Da	mplet ate Bo	ion Del ring Sta ring Co		Remarks:	L									
SORIN Er Pr		r/Geolo								Col	ntinue	ed Ne	ext Pa	age

F	Pro	jec	t Des	cription		G OF BORIN				3		4		A	\	
Depth. feet		Sample Type	Symbol / USCS	Surface Surface	on: See Drawin ce El.: 1056.2 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	g No. C00553-1 et		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
-	-		0 0	fragm Browr	n <u>CLAYEY SAND</u> with ents, damp n <u>SANDSTONE</u> , med d, weathered and iro	ium hard, medium	32.0									
-35 -	5- <b>1</b>		<b>/</b> /					100	28							
- - - -40	)		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		, medium hard to har lens @ 37.8 ft.	d from approx. 37 ft.		100	68							
- - -45 - - - - -50			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		erous carbonaceous " - 54.0')	laminations		100	86							
GPJ 2/27/01			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					98	92							
SING C00553.	om ate ate ngir	Bor Bor	/Geolo	rted: mpleted:	99.4 feet 1/4/01 1/4/01 JEN/JTS C00553	Remarks:							ntinue	ed Ne	ext Pa	age

Pro	ojec	t Des	LOG OF BORING N cription: Big Branch Slurry Impoundment Inve Martin County, Kentucky			-12 I		7				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1056.2 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
65		>>>>>>>>>>	Gray <u>SANDSTONE</u> , medium hard to hard, medium grained  - iron-stained vertical fracture @ 65.3 ft.									
- 70		>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	<ul> <li>fractured, w/occasional shale clasts (66.6' - 67.6')</li> <li>carbonaceous laminations (68.1' - 69.1')</li> </ul>	100	56							
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- vertical fracture (72.3' - 72.7')	100	96							
- 80 -  85 - 		>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	89.1	93	93							
Dat Dat Eng	e Bo	r/Geolo	arted: 1/4/01 ompleted: 1/4/01					Col	ntinu	ed Ne	ext Pa	age

Pr	ojec	t Des	LOG OF BORI cription: Big Branch Slurry Impoundm Martin County, Kentucky				3		3		7		
			Location: See Drawing No. C00553-1								,.		
#	be	SCS	Surface El.: 1056.2 feet		%		Shes	١.,		× ×	in %	# <u></u>	ŧ
Depth, feet	Sample Type	Symbol / USCS	Split Spoon		Recovery %	Rab	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
ept	dw	loqu	Shelby Tube		600	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	enel ws /	Gray	San	and	o i	iguiç	lasti
	Sa	Syn	Rock Core		ا ه		Blo P			Sit	Wat		4
			MATERIAL DESCRIPTION										
-			VOID										
  - 95 -			<ul> <li>void sample (89.4' - 99.4') brown silty sand with rock fragments, trace coal slurry 39.3% gravel; 35.8% sand; 24.9% silt and cla</li> </ul>	у	13	0							
			- void sample (93.7' - 96.0') - brown silty sand with rock fragments 42.7% gravel; 37.2% sand; 20.1% silt and cla					-					
-			Gray <u>CLAY SHALE</u> , very soft	99.2 99. <i>4</i>	-		<u> </u>						
100-			Bottom of Test Boring @ 99.4 ft.										
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110-													
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115-	-												
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වූ Dat	e Bo	ion De	arted: 1/4/01				1	<b></b>					
Dat	e Boi		mpleted: 1/4/01										
Pro	jineei ject N		C00553										

Р	rojed	ct Des		G OF BORING urry Impoundment v, Kentucky				triadeng.com	L	3		Δ		
			Location: See Drawing									٠,٥		
#	g.	300	Surface El.: 1054.0 fee	t		%		n Shes			× %	nt %	ıΪŧ	Ħ
Depth, feet	Sample Type	Symbol / USCS	Split Spoon		-	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
eb t	훁	<u> </u>   <u> </u>	Shelby Tube			900	RC	enet /s / (	3rav	San	and	ŭ	quid	astic
	Sa	Sym	Rock Core			Ϋ́		Blow P.			Silt	Vate	ا ت	ď
			MATERIAL DE	SCRIPTION				_	l.			_		
_		XXXX	Coarse <u>COAL REFUSE</u>		0.0									
-														
	_4	$\otimes$												
_					5.0									
- 5		٥	Drown OLAVEV CAND : 19	andstore frame										
F		· · · · a   · · · · ·	Brown <u>CLAYEY SAND</u> with	sandstone tragments										
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T			CASING ADVANCE W	OUT SAMPLING										
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5		0	- SPOIL/FI	LL -										
12/12	4	0												
- 30		اه ا												
		ion Dep ring Sta		Remarks: Water v	vas n	otec	ı at a	depth of	78.4	tt. up	on d	rilling	3	
ပ္ Da	te Bo	ring Co	mpleted: 1/11/01											
	iginee oject I	r/Geolo No.:	gist: JEN/CEM C00553							Cor	ntinue	d Ne	xt Pa	age

Pr	ojec	t Des		G OF BORING N urry Impoundment Inve Kentucky			3		7		A	\ [	
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Brown <u>CLAYEY SAND</u> with	sandstone fragments				:					
-40-			CASING ADVANCE W/	OUT SAMPLING									
 - 45 - 													
 50 -	1		- SPOIL/FI	LL - 50.0									
  - 55 -			Brown <u>CLAYEY SAND to SA</u> some sandstone fragments	ANDY CLAY with									
GPJ 2/27/01	ł												
Cooperation Cooper	te Boi te Boi	r/Geolo	nrted: 1/10/01 mpleted: 1/11/01	Remarks: Water was completion.			depth of		Cor			g ext Pa	age

Pr	ojec	t Des		OF BORIN rry Impoundmer Kentucky				<u> -</u>		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DES			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	}		Brown <u>CLAYEY SAND to SA</u> sandstone fragments	NDY CLAY with	63.0									
-65			Gray <u>SANDSTONE</u> , hard, m	edium grained										
			CASING ADVANCE W/O	OUT SAMPLING										
-70 -		\ \ \ \ \ \ \ \												
-  -  -		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\												
- -80		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \										•		
-	-	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\												
-85 -	- ¶	//	VOID		85.5	0		WOT/1.5' - 4						
2/28/01			- trace sand recovered (85.7 - brown and gray silty sand v trace roots (87.7' - 89.7')			30		94/2'	34	43	24			
Da Da Da Er	omplet ate Bo ate Bo	r/Geol	arted: 1/10/01 ompleted: 1/11/01	Remarks: Wate completion.	r was	note	d at a	depth of	78.4		oon o			ane)

Pro	ojec	t Des		OF BORING Irry Impoundment Ir Kentucky			triadeng.com		7		4		)
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X		VOID		25		160/2'	29	61	10			
	X		<ul> <li>less clayey, w/ cobble size fragments (89.7' - 91.7')</li> <li>sand, gravel, and cobbles (</li> </ul>		15		18/2'	47	35	18			
- 95 - - 95 -	X	$\nearrow$	Gray <u>CLAY SHALE</u> , very so	95			67/2.3'	43	37	20			
			Bottom of Test Bori										
-													
100-													
-													
-													
 105-													
-													
-						:							
110-													
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115-	-												
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3/2/01													
120- Cor Cor		ion De		Remarks: Water wa	as note	d at a	ı depth of	78.4	ft. uլ	oon d	Irillin	g	
Dat	e Bo	ring Co r/Geol	ompleted: 1/11/01	completion.									

Pro	ject	Desc	cription:		nch Slu	G OF BO Irry Impound Kentucky				triadeng.com		3		4		)
Depth, feet	Sample Type	Symbol / USCS	Surface Surface Surface	e El.: 105 Split Spoon Shelby Tube Rock Core	2.4 feet	No. C00553- CRIPTION	1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
- 10			Brown		ND with s	to very dense	5.0			2-6-3 3-3-4						
Date Date Engi	e Bor e Bor	/Geolo	arted: mpleted:	100.5 fee 11/28/00 11/28/00 JEN/CEN C00553		Remarks: G drilling ope	Froundwaterations.	ter w	as fir	st noted	at a d		of 39			

Pr	ojec	t Des	LOG OF BORING Notice in the control of the control			<u> </u>		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X	0	Brown <u>CLAYEY SAND</u> with sandstone fragments, damp, very loose to very dense			3-4-6						
- 35 -  						2-15-9-8 4-4-9-7						
- 40 - 			- wet @ 39.0 ft.		. *	4-7-11-13						
 - 45- 						4-6-6-7						
  - 50 -	X					7-7-9-9 2-5-8-10						
-	X		- SPOIL/FILL -			4-4-12-11 12-30-28-23						
- 55 - - 5 - 			Brown <u>SANDY CLAY to CLAYEY SAND</u> with some sandstone fragments, damp, dense to very dense			8-24-25-29 15-26-27-37						
- 60 -						16-28-28-28						
Date Date Eng	e Bori e Bori	/Geolo	arted: 11/28/00 drilling operations.	er wa	as fir	st noted a	t a d		of 39 ntinue			

Pro	oject	: Des		G OF BORING rry Impoundment Kentucky				2		3		7	\	)
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
-65-			Brown <u>SANDY CLAY to CLA</u> some sandstone fragments, dense	YEY SAND with damp, dense to very		•		26-26-30-33 11-24-18-31 19-21-23-25 18-18-29-37 16-24-25-38						
-70 -  - 75 - 		:F:>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Brown <u>SANDSTONE</u> , mediu grained, weathered, friable  - very soft and weathered @	m hard, medium	70.5	95	91	11-60/6"						
- 80 -   - 85 - 		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- tool drop (86.5' - 88.0')		88.0	73	26							
Dat	e Bo	ion Del			dwate	er w	as fii	st noted a	t a d	epth	of 39	).0 ft.	duri	ng

Pro	ojec:	t Des	LOG OF BORING N cription: Big Branch Slurry Impoundment Inve Martin County, Kentucky			<u> </u>		3		4		)
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1052.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
   - 95 -			COAL  - unconfined compressive strength (91.5' - 91.7') - 1,290 psi  - unconfined compressive strength (95.0' - 95.3') - 3,690 psi	<u> </u>								
		$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{$	96.0 Gray <u>CLAY SHALE</u> , very soft to soft	100	27							
100 -  			Bottom of Test Boring @ 100.5 ft.						:			
- 105  												
 -  												
 - 115- 												
		ion De		er w	as fir	st noted a	ıt a d	epth	of 39	).0 ft.	durii	ng
Date Date Eng	e Bor	ing Co /Geolo	ompleted: 11/28/00									

		cky			2-2 modeng.com						
1	Location: See Drawing No. C	0553-1			<b>10</b>				۰		
Symbol / USCS	Surface El.: 1053.4 feet		%		Penetration Blows / 6 inches	,		Silt and Clay %	ant %	ij	1
	Split Spoon		/ery	Rg D	trati 6 in	e (e	Sand %	ဦ	onte	ř	1 1 1 1 1 1 1 1 1
Depth, feet Sample Type ymbol / USC:	Shelby Tube		Recovery %	ř	ene vs /	Gravel %	Sar	and	er C	Liquid Limit	]
Syn Sa	Rock Core		œ		P Blo			Silt	Water Content %	7	(
	MATERIAL DESCRIPTI	N									L
	Coarse <u>COAL REFUSE</u>										
		4.0									
-											
5- a	Brown and gray <u>CLAYEY SAND</u> with fragments, damp, loose to medium of										ĺ
- O										:	
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10 - 10 - 10 - 11				Ī	3-4-7						ĺ
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-   a											ĺ
- 0	- SPOIL/FILL -										
-											ĺ
30 Completion De			er wa	as firs	st noted a	t a d	epth	of 35	ft. d	urnig	 }
Date Boring St Date Boring Co	arted: 11/29/00 drilli	g operations.									

Pr	ojec	t Des		G OF BORING urry Impoundment In , Kentucky			3		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1053.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	t	Recovery %	ROD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		0	Brown and gray <u>CLAYEY S</u> , fragments, damp, loose to n				4-9-9						
- 35 -  			- wet, w/mostly sandstone fr	ragments @ 35.0 ft.			8-7-9						
- 40 -  							5-5-9						
- 45 - 							9-8-10						
- 50 -		· · · · · · · · · · · · · · · · · · ·	- SPOIL/FI  Brown <u>SANDY CLAY to CL</u> /some sandstone fragments,	50.0	<u>)</u>		13-16-27						
  - 55-			como canacióno nagmente,	danip, dones									
7.27701	X						13-15-26						
Date Date Eng	e Bori e Bori	/Geolo	nrted: 11/29/00 mpleted: 11/30/00	Remarks: <b>Groundw</b> ood drilling operations.	ater wa	as fir	st noted a	t a de		of 35			

Pr	ojec	t Des		G OF BORING urry Impoundment Inv , Kentucky			ų.		7	}			
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1053.4 fee  Split Spoon Shelby Tube Rock Core MATERIAL DES	g No. C00553-1 t	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Brown <u>SANDY CLAY to CL</u> some sandstone fragments,				28-19-18						
-65 <i>-</i>	X		Brown <u>SANDSTONE,</u> mediu grained	65.5 um hard, medium			16-50/5"						
 - 70 -		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- weathered and iron-stained	76	·								
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- gray, hard from 69.2 ft.										
-75- 					100	100							
- 80 - - 80 -		`/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\											
- 85 -		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\											
		\ <u>\</u>	- shaley (86.3' - 86.7')	86.7									
127/01			VOID										
33.GPJ 27.	npleti	on Dep	(Partilly Fil	led) Remarks: <b>Groundwa</b>	ter w	as fir	st noted a	t a de	epth	of 35	ft. de	urnia	_
Date Date Eng	e Bor e Bor	ing Sta ing Co /Geolo	nted: 11/29/00 mpleted: 11/30/00	drilling operations.			or notou a			ntinue			

	<u> </u>		Martin Count Location: See Drawin			- T		Triadeng.com			<u>                                     </u>			
Depth, feet	Sample Type	Symbol / USCS	Surface El.: 1053.4 fer Split Spoon Shelby Tube Rock Core MATERIAL DE	et	Recovery %	N financia.	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	
			VOII		49	9 .	40							$\frac{1}{1}$
			(Partially	Filled)										
 95 -														
		<b>\</b>			96.8									
		$\mathbb{W}$	Gray <u>CLAY SHALE</u> , very s	oft to soft										
<del>1</del> 00 –		$\overline{M}$		1	00.5									
			Bottom of Test Bo	ring @ 100.5 ft.										
_														
	-													
105-														١
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										:				
<del>1</del> 10 –														
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<del>1</del> 15∽														
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<del>1</del> 20 –			100 - 5	T										L
Date Date Eng	e Bor e Bor	/Geolo	arted: 11/29/00 impleted: 11/30/00	Remarks: Ground drilling operation		was	i tirs	t noted a	t a d	eptn	of 35	itt. a	urnıg	J

Pr	ojec	t Des		G OF BORING I urry Impoundment Inv v, Kentucky			Ų	L	7		Δ		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.9 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	t	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
5-			Coarse <u>COAL REFUSE</u>	5.0									
  - 10-			Brown <u>CLAYEY SAND</u> with fragments, damp, medium o										
  	X						7-4-5						
		0 0 0 0 0					5-9-14						
							6-50/5"						
	X		- mostly sandstone fragmen	LL -		_	6-4-6						
Com Date Date Eng	e Bori	/Geolog	rted: 11/30/00 mpleted: 11/30/00	Remarks: Water was completion.					Con	on d			ge

	•	နွ	Location: See Drawing No. C00553-1 Surface El.: 1054.9 feet			es			%	%		
feet	Sample Type	Symbol / USCS	Split Spoon	Recovery %		Penetration Blows / 6 inches	%	%	Silt and Clay %	Water Content %	Liquid Limit	timi 1 ottocla
Depth, feet	ble	/ 100	Shelby Tube	, ove	RgD D	netra	Gravel %	Sand %	<u>Б</u>	Con	uid L	1
De	San	ym's	Rock Core	Rec		Per	Ō	S	iit a	ater	Liq	6
		8	MATERIAL DESCRIPTION			ω			0)	8		
_	X		Brown <u>CLAYEY SAND</u> with sandstone fragments, damp, medium dense			10-8-12						
-												
5 – –	X		- sandstone boulder @ 35.0 ft.			50/5"						
-												
0 – –	X	0	- mostly sandstone fragments (40.0' - 41.5')			14-18-7						
-		a	ODOU /FILL									
		ο΄. · · · · · · · · · · · · · · · · · · ·	- SPOIL/FILL -									
5-	X	·	Brown SANDY CLAY to CLAYEY SAND with some sandstone fragments, damp, dense			22-22-23						
1 1 1												
0-		7.4.7 7.4.7										
_	$\triangle$	-:				16-21-22						
1	·											
55 – –	X					17-18-19						
_		: :   : ]										
_		$\begin{bmatrix} \cdot & \cdot \\ \cdot & \cdot \end{bmatrix}$	59.0									
so –		Ĭ.	Brown SANDSTONE, medium hard						1		i	

Pro	ojec	t Desc		G OF BORING urry Impoundment Inv , Kentucky			3.		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1054.9 fee  Split Spoon Shelby Tube Rock Core MATERIAL DES	t	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 65 -		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Brown <u>SANDSTONE</u> , medit grained				50/1"						
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	- diagonal fracture @ 64.6 ft - clay seam @ 65.6 ft.		98	66							
70 <i>-</i>		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- gray, hard, with occasional inclusions from 67.6 ft.	carbonaceous									
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\											
-75 -   - 80 -		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			100	85							
		>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>									•		
- 85 -  		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		88.4									
Date Date Eng	e Bori e Bori	/Geolog	rted: 11/30/00 mpleted: 11/30/00	Remarks: Water was completion.	note	d at a	depth of	83.9		oon d			age

Pr	ojec	t Des	LOG C cription: Big Branch Slurry Martin County, Ker	OF BORING N mpoundment Inventucky			Ų		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No.  Surface El.: 1054.9 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIP		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 95 -			VOID (Partially Filled)		40	33							
100-		<b>\</b> \\\\	Gray <u>CLAY SHALE</u> , very soft to so	100.5									
  			Bottom of Test Boring @ 1	υυ.ο π.									
  					The state of the s								
Date Date Engi	Bori Bori	/Geolo	rted: 11/30/00 con mpleted: 11/30/00	arks: Water was r npletion.	otec	l at a	depth of	83.9	ft. up	on d	rilling	3	

Pro	oject	Desc	cription:		urry Impo	BORING Noundment Investor			٧.		7		4		
Depth, feet	Sample Type	Symbol / USCS	Surface Surfac	on: See Drawing e El.: 1049.5 feet plit Spoon helby Tube lock Core MATERIAL DES	t		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
8 Date	Bori	Dept. on pepting in the property of the proper	th:	120.1 feet 11/30/00 12/1/00	Remarks: drilling	Groundwat operations.	er wa	as firs	st noted a	t a d	epth	of 40	ft. d	uring	
Date Eng Proj		Geolog	mpleted: gist:	12/1/00 JEN/CEM C00553		fication lines renn						ntinue	ed Ne	ext Pa	age

Pr	ojec	t Des		G OF BORING N urry Impoundment Inve y, Kentucky					3		Δ		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1049.5 fee  Split Spoon Shelby Tube Rock Core MATERIAL DES	t	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 35 - 			Coarse <u>COAL REFUSE</u> - wet @ 33.0 ft., w/some po	ssible slurry									
- 40			Brown <u>CLAYEY SAND</u> with fragments, damp, medium o				8-9-8						
 - 50 - 							7-7-10						
- 555			- SPOIL/FI	LL -			10-7-8						
Date Date Eng	e Bori e Bori	/Geolog	rted: 11/30/00 mpleted: 12/1/00	Remarks: Groundwate drilling operations.	er wa	s firs	st noted a	t a de		of 40			

		LO	G OF BORING N	10.	DH	2-4 § I				-		
Pro	ject [	Description: Big Branch Slu Martin County	urry Impoundment Inve , Kentucky	estiga	ation	triadeng.com	L		1/			J
Depth, feet	Sample Type	Location: See Drawing Surface El.: 1049.5 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
 		. · a				4-10-4						
-65-		- mostly sandstone fragmen (60.0' - 71.5')	ts with some clay			13-15-16						
70		·	s (65.0' - 66.5')									
		· · · · · · · · · · · · · · · · · · ·				10-13-9						
-75 / 		- very salidy (75.0 - 76.5)				25-20-33						
-80-		- filter cake (80.0' - 81.5')				5-7-8						
85		- SPOIL/FI	LL - 85.0									
		Brown SANDY CLAY to CLA some sandstone fragments, dense				27-29-38						
Date Date Engir	Boring Boring	Depth: 120.1 feet    Started: 11/30/00   Completed: 12/1/00   eologist: JEN/CEM   C00553	Remarks: Groundwate drilling operations.	er wa	as fir	st noted a	t a de		of 40			

Pro	ojec	t Des	LOG OF BORING N cription: Big Branch Slurry Impoundment Inve			<u>4</u>		3		Δ		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1049.5 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	$\times$		Brown <u>SANDY CLAY to CLAYEY SAND</u> with some sandstone fragments, damp, dense to very dense			53-62/6" 24-29-29-29						
  - 95 -	X					14-25-20-25						
	X					23-36-33						
100-	**		100.0 Brown <u>SHALE</u> , soft, weathered			50/2"						
		<b>/</b>	Gray SANDSTONE with shale laminations, medium hard, fine to medium grained									
105-			- iron-stained to 102.1 ft.	93	71							
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- vertical fracture @ 103.6 ft. and 108.5 ft.									
- - 		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\										
		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				·						
415- 		) // //	- coal/shale band (116.0' - 116.5')	100	75							
2/28/01 		$\mathbb{N}$	COAL 118.2  Gray CLAY SHALE, soft									
Date Date Eng Proj	Bor Bor ineer ect N	/Geolo	oth: 120.1 feet rated: 11/30/00 rmpleted: 12/1/00 Remarks: Groundwat drilling operations.					Cor	of 40			

Pro	ojec	t Des	cription: <b>Big Bran</b> <b>Martin C</b>	LOG OF BOR ch Slurry Impoundm ounty, Kentucky				3		3		4		)
				awing No. C00553-1	už (			, <u>,</u>			_	9		
ᇥ	,be	ဒင္သင္	Surface El.: 1049	.5 feet		%		E G			% 	ant 9	ŧ	nit
, fe	е Ту	ŝ) /	Split Spoon			/ery	RQD	ratic 6 in	<u>@</u>	%   0	Sa Ca	onte	트	٠Lir
Depth, feet	Sample Type	Symbol / USCS	Shelby Tube			Recovery %	쬬	enel	Gravel %	Sand %	Silt and Clay %	er C	Liquid Limit	Plastic Limit
	Sa	Sym	Rock Core			ď		Penetration Blows / 6 inches			Silt	Water Content %	ב	₫.
			MATERI	AL DESCRIPTION										
			Bottom of Te	st Boring @ 120.1 ft.	120.1	-								
													1	
L													ł	
125-														
F -														
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පි Dat	e Bor	on De ing Sta		Remarks: Gro		er wa	as fir	st noted a	at a d	epth	of 40	ft. d	uring	
Eng Pro		/Geol												

Pro	oject	Des	cription:	Big Bra Martin (	nch Slu		oundm				triadeng.com	L	4				)
Depth, feet	Sample Type	Symbol / USCS	Surface Surfac	on: See D e El.: 105 plit Spoon thelby Tube cock Core	1.2 feet				Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse	e COAL REF													
GPJ <i>2/27/</i> 01	1							30.0									
Congue Co	e Bori e Bori	Geolo/	rted: npleted:	110.0 feet 12/1/00 12/2/00 JEN/CEM C00553		Remarks drilling			er wa	as fir	st noted	at a d		of 45			

Pr	ojec	t Des	LOG OF BORIS cription: Big Branch Slurry Impoundment Martin County, Kentucky			2		7	}			
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1051.2 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Brown <u>CLAYEY SAND</u> with sandstone fragments, damp, very loose to medium dense			3-2-2						
- 35 -  						5-8-12						
 40 - 			- trace coal fragments @ 40.0 ft.			8-11-19						
- 45 - 			- wet @ 45 ft., w/mostly sandstone fragments			10-8-16						
 - 50 - 			- gray sandstone fragments (50.0' - 51.5')			6-5-7						
- 55 - 			- mostly sand w/some sandstone fragments (55.0' - 56.5')			7-8-13						
Dat Dat Eng	e Bor e Bor	/Geolo	nted: 12/1/00 drilling operation of the drilling operation operation of the drilling operation of the drilling operation operation operation operati	ndwater w ons.	as fir	st noted a	ıt a d				uring	

## LOG OF BORING NO. DH2-5 Project Description: **Big Branch Slurry Impoundment Investigation** Martin County, Kentucky Location: See Drawing No. C00553-1 Water Content % Symbol / USCS Penetration Blows / 6 inches Surface El.: 1051.2 feet Plastic Limit Sample Type Recovery % Liquid Limit Depth, feet Silt and Clay Gravel % Sand % Split Spoon RQD Shelby Tube Rock Core **MATERIAL DESCRIPTION** 12-6-7 Brown and gray **CLAYEY SAND** with sandstone fragments, damp to wet, very loose to medium dense - mostly gravel-size sandstone fragments (60.0' - 61.5') 65 10-15-13 5-6-9 - SPOIL/FILL -76.0 10-16-24 Brown SANDY CLAY to CLAYEY SAND with some sandstone fragments, damp, very dense 22-27-28 85 20-50/5" BORING C00553.GPJ Remarks: Groundwater was first noted at a depth of 45 ft. during Completion Depth: 110.0 feet 12/1/00 Date Boring Started: drilling operations. Date Boring Completed: 12/2/00 JEN/CEM C00553 Engineer/Geologist: Continued Next Page Project No.:

	-,		Martin Coun	Slurry Impoundme ty, Kentucky		1	T	2-5 mol						
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawi Surface El.: 1051.2 fe Split Spoon Shelby Tube Rock Core MATERIAL D	~ ,		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	
	X		Brown <u>SANDY CLAY to C</u> some sandstone fragmen					16-24-30						
	X		- very clayey @ 92.5 ft., w	//some coal fragments				20-26-27						
- 95 		1: /////	Gray <u>CLAY SHALE</u> , very	soft to soft	95.0			50/1"						
00-						84	39							
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Curu CANDCTONE with a	hala lancin ati	102.1									
105-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Gray <u>SANDSTONE</u> with s medium hard, fine to med			98								
		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				90	90	1		i L				
10		<i>`</i>	Bottom of Test Bo	ring @ 110.0 ft.	110.0									
115 -														
120				<b>—</b>										
Com Date Date	Bori Bori ineer	/Geolog	rted: 12/1/00 mpleted: 12/2/00	Remarks: Ground drilling operation		er wa	s firs	t noted at	t a de	epth (	of 45	ft. du	ıring	

Pro	ojec	t Des	cription		G OF BO urry Impour , Kentucky				triadeng.com	L	7	}	4		
Depth, feet	Sample Type	Symbol / USCS	Surface Surfac	on: See Drawing ce El.: 1052.0 fee Split Spoon Shelby Tube Rock Core MATERIAL DES	t	3-1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
වූ Date	Bori	on Depping Sta	th:	105.2 feet 12/2/00	Remarks: 0	30.0 Goundwate erations.	r was	s first	t noted at	a de	pth o	f 50 1	ft. du	ring	
Date Proj	Bori	ng Cor 'Geolog	npleted:	12/4/00 JEN/CEM C00553	The stratifica							ntinue	ed Ne	xt Pa	ige

		S	Location: See Drawing No. C00553-1			Sg.			%	%		
feet	Sample Type	Symbol / USCS	Surface El.: 1052.0 feet  Split Spoon	% ^		Penetration Blows / 6 inches	%	8	lay %	Water Content %	imit	<u>.</u>
Depth, feet	nple	/ loq	Shelby Tube	Recovery %	Rab	netra s / 6	Gravel %	Sand %	Silt and Clay	ပ်	Liquid Limit	Disetic Limit
മ്	Sar	Sym	Rock Core	8		Pe	ဗ	"	Silt	Vate	Lis	6
			MATERIAL DESCRIPTION							_		L
1 1	X	0	Brown <u>CLAYEY SAND</u> with sandstone fragments, damp, medium dense			6-5-7						
-		a				;						
- 35 -		a										
	X	a				5-7-8						
		a										
-		a										
10-	$ egthinspace{1.5em} otag$	a	- very sandy, with numerous gray sandstone			20-15-13						
1	$\triangle$	a	fragments (45.0' - 46.5')			20-13-13						
4		a		-				ı				
- 15 –		. ° . · a								,		
13 – –	X	a				4-3-18		1				
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-												
		D						at.				
_	X	a	- wet @ 50.0 ft.			11-8-8						
-		a					-					
-		٥٠٠٠										
_		ρ										
55		. α	- brown and gray, very sandy, w/some coal							}		
-	$\Delta$	, ° , · , a	fragments (55.0' - 56.5')			7-7-10						
-		0'.'										
			- SPOIL/FILL -									
-		a							1			

Pr	ojec	t Des		G OF BORING irry Impoundment I Kentucky			3		3		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X	α αα	Brown and gray <u>CLAYEY SA</u> fragments, damp, medium d				5-7-6						
- 65			- w/small wood fragments @	60 ft.									
	X		- SPOIL/FII	.L -			11-11-19						
 -70-	X	· · · · · · · · · · · · · · · · · · ·	Brown SANDY CLAY to CLA	YEY SAND with	0.0		17-25-31						
			some sandstone fragments, dense	gamp, dense to very									
- 75 - 	X		w/gray mottling from 75 ft.				17-25-31						
- 80 -													
- 80 -	X						21-32-31						
 - 85 -						:	40.00.40						
							13-23-18						
06 – 80 – 2077		. :: . :: :			0.0								
Cor Dat Dat	e Bor e Bor		arted: 12/2/00 mpleted: 12/4/00	Remarks: Goundy drilling operations		s firs	t noted at	a de	pth c	of 50	ft. du	ıring	
Eng Pro	jineer ject N	/Geolo lo.:	ogist: <b>JEN/CEM</b> <b>C00553</b>						Cor	ntinue	ed Ne	ext Pa	age

Pro	ojec	t Des		OG OF BORII lurry Impoundme y, Kentucky				ų		7				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawin Surface El.: 1052.0 fee Split Spoon Shelby Tube Rock Core MATERIAL DE	et .		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X		COAL					22-27-37						
	X				93.5		,	15-18-37						
- 95 - - 9 - 			Gray <u>CLAY SHALE,</u> very s	oft to soft				50/2"						
100-					100.7	100	90							
		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Gray <u>SANDSTONE</u> with sh medium hard to hard, fine t		105.2									
105-			Bottom of Test Bor	ing @ 105.2 ft.	105.2									
  - 110-														
 -115-			en en en en en en en en en en en en en e											
1 1 1					.·									
Date Date Eng	e Bor e Bor	/Geolo	arted: 12/2/00 mpleted: 12/4/00	Remarks: Goun drilling operation		er wa	s firs	t noted at	a de	pth c	of 50	ft. du	ring	

Р	rojec	t Des		G OF BORING rry Impoundment Kentucky				2-7 mol		7		4		
			Location: See Drawing	No. C00553-1					_					
	0	၂ တ္က ၂	Surface El.: 1051.7 feet		į	.0		les Jes			%	t %	L.	
Depth, feet	Ιğ	SS	Split Spoon		Ì	Recovery %		inch	Gravel %	8	Slay	ıten	Liquid Limit	Plastic Limit
Į ₹	<u>.</u>	=	Shelby Tube			ove	RQD	etra 76	ave	Sand %	ס פר	Sor	l pir	stic
l de	Sample Type	Symbol / USCS	Rock Core			Rec		Penetration Blows / 6 inches	<u>්</u>	Š	Silt and Clay %	Water Content %	Liq	Pla
1	00	8	MATERIAL DES	CDIDTION				ã			S	×		
			MATERIAL DES	CRIPTION										
_			Coarse <u>COAL REFUSE</u>											
- - 5 - -	- - - - -													
- -10 - - -	-													-
- 15 - - -	-													
-20 -													i	
Γ					23.0									
- - -25			Brown and gray <u>CLAYEY SA</u> fragments, damp, medium d	ND with sandstone										
	-		- SPOIL/FI	LL -					į					
2/27/	-4													
ලි – 30		لمنا	405.55 4	D	dsee-4	0		nt noted		lonet	OF A!		l l pin a	<u> </u>
ZING C00553.	omple ate Bo ate Bo	er/Geold	arted: 12/14/00 ompleted: 12/15/00	Remarks: Ground drilling operation		er w	as tir	st noted (	at a d				ext P	

Pr	ojec	t Des		OG OF BORING N urry Impoundment Inv r, Kentucky			Ÿ		4	}	Δ		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1051.7 fee  Split Spoon Shelby Tube Rock Core MATERIAL DE	<b>t</b>	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
- 35			Brown and gray <u>CLAYEY S</u> fragments, damp, medium o										
-45 -   - 50 - 			- wet, w/sandstone boulder (	@ 45 ft.			5-7-9			5.47			
- 555	X		- mostly sandstone fragmen				11-9-14						
Date Date Eng	Bori Bori	Geolog	rted: 12/14/00 npleted: 12/15/00	Remarks: <b>Groundwat</b> drilling operations.	er wa	us firs	st noted at	t a de			ft. du		ige

			Location: See Drawing No. C00553-1								,o		
et et	ğ.	Symbol / USCS	Surface El.: 1051.7 feet		%		Penetration Blows / 6 inches	Q.		Silt and Clay %	Water Content %	ı <u>i</u>	1 .
,fe	Sample Type	>	Split Spoon		Recovery %	ROD	trati 6 in	Gravel %	Sand %	<u> </u>	onte	Liquid Limit	Disetic I imit
Depth, feet	dw	<u> </u>	Shelby Tube		600	ř	ene vs/	Gra	Sar	ang	er C	igui	3
	SS	Syl	Rock Core		~		Blo			iš	Wat		٩
			MATERIAL DESCRIPTION										
-		a	Brown and gray <u>CLAYEY SAND</u> with sandstone fragments, damp, medium dense to very dense				50/2"						
		ه											
		0 .	- SPOIL/FILL -										
-		a		65.0							:		
65 –	/			00.0									
-	X	<u>  :: .                               </u>	Brown and gray <u>SANDY CLAY to CLAYEY</u> <u>SAND</u> with some sandstone fragments, damp,				11-11-17						
_			medium dense to very dense										
_		- <u>-</u>	`										
		- <u>-</u>											
70 -	$\bigvee$	[·-:]					25-25-28						
_							25-25-20						
-		. ·    - · · · .				1							
-		1											
_		<u> </u>											
75 -		├. <u>.</u>											
13	$\approx$		•				50/4"						
-		. <del></del> .]											
-		$[\cdot \cdot \cdot]$											
		. <del></del>			37	0							
_													
80 -		. <del></del> .											
-			•	04.0									
_		· · ·		81.3		W. 11							
-		$\angle$	Brown SANDSTONE, medium hard, medium										
_	H	//	grained, weathered	83.5	88	42							
-		M	Gray <u>SHALE,</u> soft										
85 -		$\langle$	- interbedded sandstone (84.3' - 84.8')										
_		$\leq$	- interpeducu sanustone (or.o - or.o)	86.0									
_			COAL										
			_			}							
_									ļ				
-													
90-	L	ion De	oth: 105.5 feet Remarks: Grou		L	<u> </u>	st noted a		L	L			L_

Pro	ojec	t Des	LOG OF BORIN cription: Big Branch Slurry Impoundmen Martin County, Kentucky				triadeng.com		3				
			Location: See Drawing No. C00553-1										
۱	စ္ခ	ા	Surface El.: 1051.7 feet		%		n hes			8	%	, <u>.</u>	#
e e	≱	Sn	Split Spoon		ار ا	Ω	atio	% 	%	Clay	nte	Ë	Ë
Depth, feet	Sample Type	/ loc	Shelby Tube		Recovery %	RQD	s / 6	Gravel %	Sand %	Pi g	ပြ	Liquid Limit	Plastic Limit
ది	San	Symbol / USCS	Rock Core		æ		Penetration Blows / 6 inches	٥	"	Silt and Clay	Water Content %	=	ä
		0	MATERIAL DESCRIPTION				ш				>		
-			COAL		93	9							-
<b>†</b> -													
				94.1					:				
95-			Gray CLAY SHALE, very soft to soft, becoming										
		$\langle$	sandier and medium hard w/depth	-									
		$\leq$											
_		$\langle \rangle$											
<b>-</b>		$\langle \rangle$											
		$\langle \rangle$											
100-		$\langle \rangle$											
		$\langle$			99	86							
		$\searrow$		101.6									
		$\times$	Gray SANDSTONE with shale laminations,										
<b>-</b>			medium hard, fine to medium grained										
<b>-</b>		$^{\prime\prime}$											
105-		//		105.5									
L -			D. W of T t Daving @ 105 5 #										
			Bottom of Test Boring @ 105.5 ft.	İ									
-													
110-													
-	ł			ļ									
	ŀ												
L -													
-													
115-													
-													
2/27/01													
2/2	1												
වි Dat	e Bo e Bo	ion Der ring Sta ring Co r/Geolo	arted: 12/14/00 drilling operation mpleted: 12/15/00		er w	as fir	st noted a	it a d	epth	of 45	ft. d	uring	)

Pro	ojec	t Des		G OF BORING N irry Impoundment Inve Kentucky			3	L	7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1057.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
  - 5- 			Coarse <u>COAL REFUSE</u> Brown <u>CLAYEY SAND</u> with stragments, damp, medium d					•					
							<del>4-4-</del> 12 <del>7-8-</del> 10						
			- SPOIL/FI	LL -			5-44-50/4"						
- 25 -			Brown <u>SANDY CLAY to CLA</u> some sandstone fragments, dense	damp, dense to very			13-24-24						
Cor Dat Dat Eng	e Bor e Bor	/Geolo	arted: 12/8/00 mpleted: 12/9/00	Remarks:					Coi	ntinu	ed Ne	ext P	age

Pro	oject	t Des	LOG OF BORING cription: Big Branch Slurry Impoundment In Martin County, Kentucky			2	L	7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1057.0 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X		Brown <u>SANDY CLAY to CLAYEY SAND</u> with some sandstone fragments, damp, dense to very dense			16-37-35						
 -35-	X		37.			13-24-24						
  -40-		:=\ \ \ \ \ \ \ \	Gray <u>SANDSTONE</u> , medium hard to hard, medium grained - iron-stained (37.0' - 39.5')			<del>50/2"</del>						
  		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- occasional carbonaceous laminations (39.5' - 44.1')	100	75							
 - 50 - 		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- numerous carbonaceous laminations (47.0' - 52,4')	100	84							
-55-  		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- iron-stained vertical fracture (59.9' - 60.4')									
Dat Dat Eng	e Bor te Bor	r/Geolo	arted: 12/8/00 mpleted: 12/9/00					Co	ntinu	ed N	ext P	age

Pro	oject	Des	LOG OF BORING cription: Big Branch Slurry Impoundment Martin County, Kentucky				triadeng.com		3		4		
			Location: See Drawing No. C00553-1								٠		
ا يد	e g	SS	Surface El.: 1057.0 feet		%		Penetration Blows / 6 inches			Silt and Clay %	Water Content %	ij	ŧ
Depth, feet	Sample Type	, us	Split Spoon		Recovery %	RQD	ratic 5 inc	Gravel %	Sand %	[ 등	onte	Liquid Limit	Plastic Limit
pth,	nple	pol /	Shelby Tube		SCO.	R	enet vs / (	] Srav	San	and	ر ا	quio	astic
ا ۵	Sar	Symbol / USCS	Rock Core		Ϋ́		B P	~		S	Nate		颪
			MATERIAL DESCRIPTION										
_		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Gray <u>SANDSTONE</u> , medium hard to hard, medium grained		99	79							
		<i>//</i>	- iron-stained (59.9' - 63.9')										
-65 <i>-</i> 		\ <u></u>											
		$\left[\begin{array}{c} \\ \\ \end{array}\right]$											
		×											
		Ž											
-70 -		<u>```</u> ]											
		<b>/</b> /		ļ	100	100							
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	Н	//		ŀ									
		<i>~</i> ~											
		$\mathcal{L}$											
		//	- clay seam (79.1' - 80.0')										
-80-		\ <u>\</u>			40	6				ļ			
		<b>/</b> /		İ	,,,				1				
		~~	Device chandened @ 94.4 ft after drilling rode	15.		ļ							
			<ul> <li>Boring abandoned @ 84.4 ft. after drilling rods became stuck in hole</li> </ul>	İ									
<b>.</b> -				84.4									
- 85 -		~ ~	Bottom of Test Boring @ 84.4 ft.	5-77									
	-												
			·						1				
-90 <i>-</i>		ion Da	pth: <b>84.4 feet</b> Remarks:			1	<u> </u>	<u></u>	<u></u>	<u> </u>	<u></u>	<u></u>	<u> </u>
Dat Dat	e Bo e Bo	ion De ring St ring Co r/Geolo	arted: 12/8/00 completed: 12/9/00								į		

Pr	ojec	t Des		OF BORING N rry Impoundment Inve Kentucky			3		7		Δ		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1056.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DESC		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse <u>COAL REFUSE</u> Brown <u>CLAYEY SAND</u> with s	2.0									
- 5-			fragments, damp, medium de	nse to very dense									
  -10-	1												
		a											
- 15 - 													
 20-							12-12-10-54						
							39-20-14-9						
- 25 - 	X	0					34-35-26-20 16-23-50/2"						
		on Dep		L -  Remarks: Water was completion.	noted	d at a	50/1" depth of	84.7	ft. up	on d	rilling	9	
Date Date Date Date Date Date Date Date	e Bor	ing Col /Geolo	mpleted: 1/18/01	completion.					Cor	ntinue	ed Ne	ext Pa	age

Pr	ojec	t Des	cription: Big Branch Slurry I Martin County, Ken					Ų -		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No.  Surface El.: 1056.0 feet  Split Spoon  Shelby Tube Rock Core  MATERIAL DESCRIPT			Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
		0.0	Brown <u>CLAYEY SAND</u> sandstone damp, medium dense to very dens					50/1"						
	X	a	- SPOIL/FILL -		34.0			5-14-18-17						
-35- 			Brown <u>CLAYEY SAND to SANDY</u> some sandstone fragments, damp to very dense					18-30-36-41						9
	X		·					32-75/5" 29-57-50/1"					:	
-40-														
	X	. <del></del>						28-42-42-40						
								21-27-30-32 27-24-27-29	i					
- 45 -  			CASING ADVANCE W/OUT S. (46.0' - 51.6')	AMPLING			:	21-24-21-29						
-50-		·	Brown <u>SANDSTONE</u> , medium hard grained, weathered, friable	l, medium	49.5									
  -55-														
C00653.GPJ 2/28/01			- occasional diagonal fractures (56.1' - 61.4')			98	46	·						
	e Bori e Bori	on Dep ng Sta ng Cor 'Geolo	rted: 1/17/01 com mpleted: 1/18/01	arks: Water pletion.	was r	note	d at a	depth of	84.7	ft. up	on d	rilling	 J	
	ect N		C00553							Con	tinue	d Ne	xt Pa	ge

Pr	ojec	t Des		G OF BORING N rry Impoundment Inve Kentucky			3		7		4		)
			Location: See Drawing	No. C00553-1							٠,		
#	B B	SSS	Surface El.: 1056.0 feet		%		Penetration Blows / 6 inches	٠		%	Water Content %	ij	nit Lit
Depth, feet	Sample Type	Symbol / USCS	Split Spoon		Recovery %	RQD	rratic 6 inc	Gravel %	Sand %	Silt and Clay %	onte	Liquid Limit	Plastic Limit
epth	Mg H	loqu	Shelby Tube		8	%	enet vs / (	Grav	San	and	er C	iquid	astic
	Sa	Syn	Rock Core		ا مَدَ		Blo P			툸	Wat		<u>a</u>
			MATERIAL DES	CRIPTION									
		`\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Brown <u>SANDSTONE</u> , mediu grained, weathered, friable	m hard, medium									
-65-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			98	52							
-													į
		<b>/</b> //	- gray, medium hard to hard	from 66.9 ft.							}		
70-		` <i>`</i> \							\$				
		<b>/</b> /										į	
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		[ \ \ ]			100	95							
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-85-		<b>/</b> /											
<b>-</b>		<i>///</i>											
-		<b>/</b> /											
		<i>X</i> ./	- resume casing advance @	88.0 ft.									
1 2/28/01		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		89.5									
ਲੂ - 90 -	mple*	ion De <sub>l</sub>	oth: 100.1 feet	Remarks: Water was	note	d at a	denth of	84 7	ft	on d	rillin	u	
ලි Dat	e Bo e Bo	ring Sta ring Co	arted: 1/17/01 impleted: 1/18/01	completion.		6	. aoptii Oi	<b>⊍</b> 7.1	uj	-		ਤ	
Eng Pro	ginee iect l	r/Geold	ogist: JEN/JTS C00553						Coi	ntinue	ed Ne	ext Pa	age

Pro	ojec	t Des		G OF BORI urry Impoundme , Kentucky				ų.	L	3		4		
			Location: See Drawing	No. C00553-1								_		
#	g D	SSS	Surface El.: 1056.0 feet	t		8		Penetration Blows / 6 inches		ļ	%	Water Content %	<u>#</u>	Ħ
Depth, feet	Sample Type	Symbol / USCS	Split Spoon			Recovery %	RQD	ratio 5 inc	Gravel %	Sand %	Silt and Clay	onte	Liquid Limit	Plastic Limit
epth	m pk	loqu	Shelby Tube			S S	8	enet	Srav	San	and	ŭ	pinp	astic
	Sa	Sym	Rock Core			&		Blov P	~		Silt	Vate	_ ت	ā
			MATERIAL DES	SCRIPTION				_				١		
	$\setminus$		VOID					wot/2'						
-	$\langle \cdot \rangle$		- slurry w/sand and gravel (8	9.8' - 93.1')										
	$\triangle$		- gray sandstone cobble (93	.1' - 93.8')				21/2'	27	32	41			
-95-	X		- slurry, sand, and gravel (93	3.8' - 95.8')				40/2'	34	24	42		27	21
<u> </u>			- silty sand with rock fragme	nts (95.8' - 97.8')				37/2'	47	42	11			
-			- slurry with sand and gravel	(97.8' - 99.9')					04	24	40		00	
100-			- gray clay shale (mine floor)	@ 99.9 ft.	100.1			wot/2.1'	21	31	48		33	26
-			Bottom of Test Borin	ng @ 100.1 ft.										
<b>-</b>							·							
-														
 105 -														
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110-				_			İ							
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115-							ł							
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3/2														
ලි Date	Bori Bori	on De ng Sta ng Co 'Geolo	arted: 1/17/01 mpleted: 1/18/01	Remarks: Wate completion.	er was i	noted	l at a	depth of	84.7	ft. up	oon d	rilling	<b></b> 1	
Proj	ect N		C00553											

				LO	G OF BO	RING N	10.	DH:	3-1 🥫 I		4		7		
Pr	ojec	t Des	cription:	Big Branch Slu Martin County	ırry Impound , Kentucky	ment Inve	estiga	ation	triadeng.com		5	1/			
Depth, feet	Sample Type	Symbol / USCS	Surface S s	on: See Drawing e El.: 1050.0 feet plit Spoon helby Tube ock Core MATERIAL DES		1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse	COAL REFUSE											
Date Date Date Date Date Date Date Date	te Bo te Bo	r/Geold	arted: ompleted:	120.1 feet 12/5/00 12/5/00 JEN/CEM C00553	Remarks: G drilling ope	roundwat erations.	ter w	as fir	st noted a	at a d				uring	

Pro	ojec	t Des		G OF BORING N erry Impoundment Inve Kentucky			3		7		4		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1050.0 feet Split Spoon Shelby Tube Rock Core MATERIAL DES		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Coarse COAL REFUSE										
-45			- wet @ 45 ft.  Brown <u>CLAYEY SAND</u> with s fragments, damp, medium de	ense to dense			6-6-6 4-18-30 5-4-7						
Date Date Eng	e Bor e Bor	/Geolo	arted: 12/5/00 mpleted: 12/5/00	Remarks: <b>Groundwa</b> t drilling operations.	ter w	as fir	st noted a	at a d		of 45			

Pr	ojec	t Des		G OF BORIN urry Impoundmer v, Kentucky						3		4		)
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1050.0 fee  Split Spoon Shelby Tube Rock Core  MATERIAL DES	t		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	X	0 0 0	Brown <u>CLAYEY SAND</u> with fragments, damp, medium o					6-10-11						
- 65 - 	X							12-19-16						
- 70 - - 70 -	X	0						9-9-8						
  -75-		0	- SPOIL/F		75.0			5-10-39						
 			some sandstone fragments,											
80  								20-50/3"						
- 85 - 						20	0	50/1"						
		on Der			ıdwate			st noted a	t a de	epth o	of 45	ft. du	ıring	
Eng	e Bori	'Geolo	mpleted: 12/5/00	drilling operatio	ns.					Con	ntinue	d Ne	xt Pa	ge

Pro	ojec	t Des		G OF BORING I urry Impoundment Inv , Kentucky			ų.		3				
	Φ	SS	Location: See Drawing Surface El.: 1050.0 fee				es			%	%		_
feel	Typ	)SN	Split Spoon		چ ا		ation	%	%	Jay	Je Je	Ē	Ë
Depth, feet	Sample Type	/ loq	Shelby Tube		Recovery %	RØB	netra s / 6	Gravel %	Sand %	P P	Š	Liquid Limit	Plastic Limit
۵	Sar	Symbol / USCS	Rock Core		å		Penetration Blows / 6 inches	٥	%	Silt and Clay	Water Content %	Ę	Pla
			MATERIAL DE	SCRIPTION							5		
			Brown <u>SANDY CLAY to CL</u> some sandstone fragments	AYEY SAND with damp, very dense	48	14							
- 95 -   					8	8							
 			Gray <u>SANDSTONE</u> with sha medium hard, fine to mediur										
 - 105 -		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	medium naru, ilile to mediui	n granieu	88	81							
  410-		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\											
   - 115 -					100	98							
   Com Date Date Engi													
Com Date Date	Bori Bori		rted: 12/5/00 npleted: 12/5/00	Remarks: <b>Groundwat</b> drilling operations.	er wa	as fir:	st noted a	t a de	epth (	of 45	ft. dı	uring	
Engi Proje		Geolog	gist: JEN/CEM C00553						Con	itinue	d Ne	xt Pa	age

Pro	ojec	t Des	cription:		G OF BO urry Impound , Kentucky				Ψ.		7				
Depth, feet	Sample Type	Symbol / USCS	Surfac S S	on: See Drawing e El.: 1050.0 feet plit Spoon helby Tube ock Core MATERIAL DES		-1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
				Bottom of Test Borin	ng @ 120.1 ft.	120.1									
125 - 						į				3					
130 –															
135 -															
40 -															
45 <del>-</del>															
Date	Bor	on Del		120.1 feet 12/5/00 12/5/00	Remarks: G	roundwat rations.	er wa	as firs	st noted a	at a d	epth	of 45	ft. d	uring	ı

									Tany 1								
 - 15- 																	
- 10- - 10-	}									10 TV							
	}													,			
  - 5-	}																
]	Š	syr		MAT  COAL R		ESCRIPT	ION	· · · · · · · · · · · · · · · · · · ·	<u>«</u>					Silt	Wat		
Depth, feet	Sample Type	Symbol / USCS	Surfac Surfac	on: See e El.: 1 plit Spoon helby Tub	051.4 fe	-	J00939	-1	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	

Pr	ojec	t Des	LOG OF BOR cription: Big Branch Slurry Impoundm Martin County, Kentucky				<u> </u>		7	}	7		
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing No. C00553-1 Surface El.: 1051.4 feet  Split Spoon Shelby Tube Rock Core MATERIAL DESCRIPTION		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
	1	$\bigotimes$	Coarse <u>COAL REFUSE</u>	32.0									
	ł	a	Brown and gray <u>CLAYEY SAND</u> with sandstone fragments, damp, medium dense to dense	•									
-35-	X	a					5-8-7						
 	-	a			100								
-40 - 	X	0 a	- wet @ 40 ft.				7-6-21						
		a											
-45- 	X	a					5-9-6			:			
		a	·										
-50-	X	, , a	- boulder @ 51 ft.				8-15-13						
		a							-				
- 55 - 	X	a					7-20-50/1"						
		a 	- SPOIL/FILL -										
		ion Der			er wa	as fir	st noted a	t a d	epth	of 40	ft. d	uring	1
Dat Dat Eng	e Bor	ring Co r/Geolo	mpleted: 12/6/00						Coi	ntinu	ed Ne	ext Pa	age

Pro	ojec	t Des		G OF BORING N urry Impoundment Inve , Kentucky			<u> </u>	L	3				
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1051.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	t	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
_	X		Brown SANDY CLAY to CLA some sandstonne fragments dense to dense				20-26-33						
 -65-	<b>X</b>		- boulder @ 65 ft.				50/6"						
 - 70 - 	X		- trace coal fragments @ 70	ft.			17-19-20						
 -75- 	X						17-19-17						
- 80 - 80 	X						6-5-10						
- 85 - 			- SPOIL/F	ILL - 87.8			38-18-22-28 14-30-50/2"						
-  -90-			COAL			- C - C - C - C - C - C - C - C - C - C		• • • •	onth	05 40	) ft d		
Date Date Eng	e Bo e Bo	r/Geolo	arted: 12/6/00 ompleted: 12/6/00	Remarks: Groundwat drilling operations.	er W	as Tir	St noted a	ı. a Q		ot 40			

Pr	ojec	t Des	Martin County, I		vestig	ation	3-2 moo:com	L	-			
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing I Surface El.: 1051.4 feet Split Spoon Shelby Tube Rock Core MATERIAL DESC		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit
			COAL		73	0						
- 95 - - 95 -  			Gray <u>CLAY SHALE,</u> very soft t sandier and medium hard with		0 100	40						
105  105 - 		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Gray <u>SANDSTONE</u> with shale medium hard, fine to medium o		100	96						
-110 - 		\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Bottom of Test Boring	110. @ 110.5 ft.	5							
 -115- 												
Date Date Eng	e Bori e Bori	/Geolo	nrted: 12/6/00 mpleted: 12/6/00	Remarks: <b>Groundw</b> drilling operations.	ater wa	as fir	st noted a	at a d	epth (	of 40	ft. du	uri:

Pro	Project Description: Big Branch Slurry Impoundment Investigation Martin County, Kentucky														
Depth, feet	Sample Type	Symbol / USCS	Surface Surfac	on: See Drawing e El.: 1052.7 feet plit Spoon helby Tube ock Core MATERIAL DES	•		Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			oth:	105.1 feet 12/6/00			er wa	as fir	st noted a	ıt a d	epth	of 35	ft. d	uring	
Date Date Eng Proj	e Bor	/Geolo	mpleted:	12/6/00 12/7/00 JEN/CEM C00553	drilling operati							ntinue	ed Ne	ext Pa	age

Project Description: Big Branch Slurry Impoundment Investigation Martin County, Kentucky													
		Т	Martin County,	Kentucky		· · · · · ·	triac						
Depth, feet	Sample Type	Symbol / USCS	Location: See Drawing Surface El.: 1052.7 feet Split Spoon Shelby Tube Rock Core MATERIAL DES	·	Recovery %	RQD	Penetration Blows / 6 inches	Gravel %	Sand %	Silt and Clay %	Water Content %	Liquid Limit	Plastic Limit
			Brown and gray <u>CLAYEY SA</u> fragments, damp, loose to m				5-3-6						
- 35 -  			- wet @ 35 ft.				3-3-6						
40 -  			- Unable to push shelby tube fragments	@ 40 ft. due to rock			31-28-9						
45 -  			- SPOIL/FI	ILL			3-6-21						
- 50 -   			Brown <u>SANDY CLAY to CLA</u> some sandstone fragments,	<u>YEY SAND</u> with damp, dense			23-26-28						
- 555							18-25-26						
Da Da En	Completion Depth: 105.1 feet Date Boring Started: 12/6/00 Date Boring Completed: 12/7/00 Engineer/Geologist: JEN/CEM Project No.: C00553  Remarks: Groundwater was first noted at a depth of 35 ft. during drilling operations.  Continued Next Page												